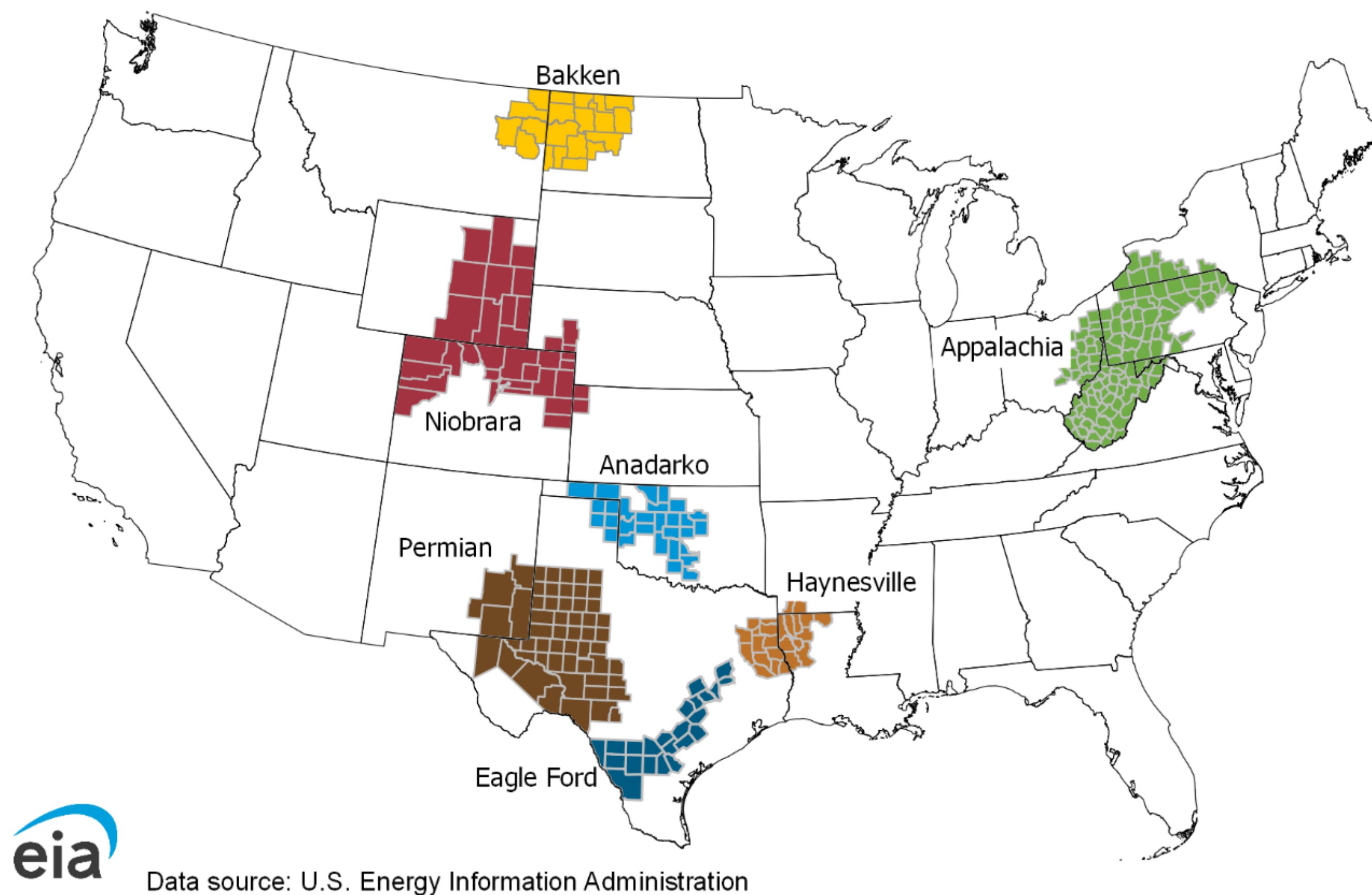




Drilling Productivity Report

For key tight oil and shale gas regions



Contents

Year-over-year summary	2
Anadarko Region	3
Appalachia Region	4
Bakken Region	5
Eagle Ford Region	6
Haynesville Region	7
Niobrara Region	8
Permian Region	9
Explanatory notes	10
Sources	11



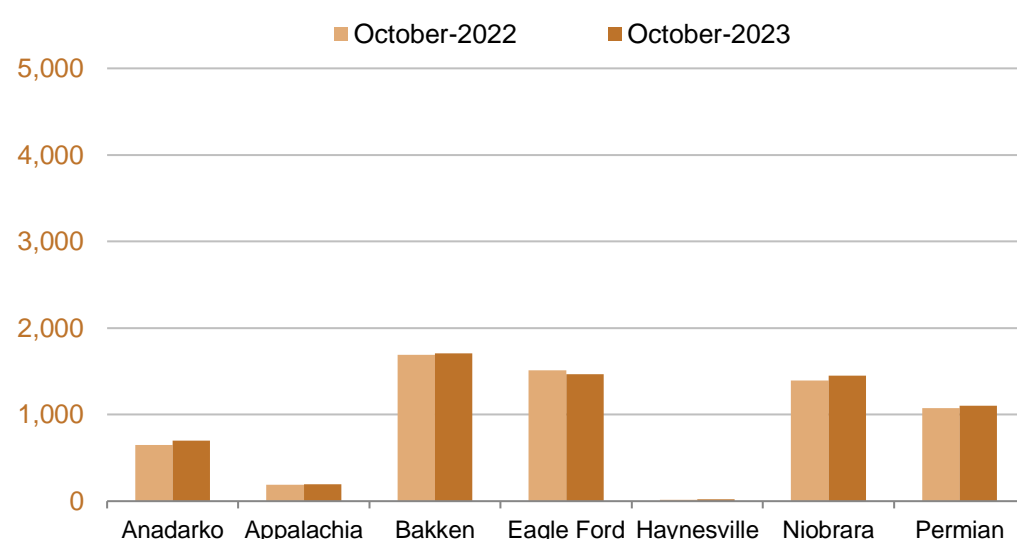
Year-over-year summary

Drilling Productivity Report

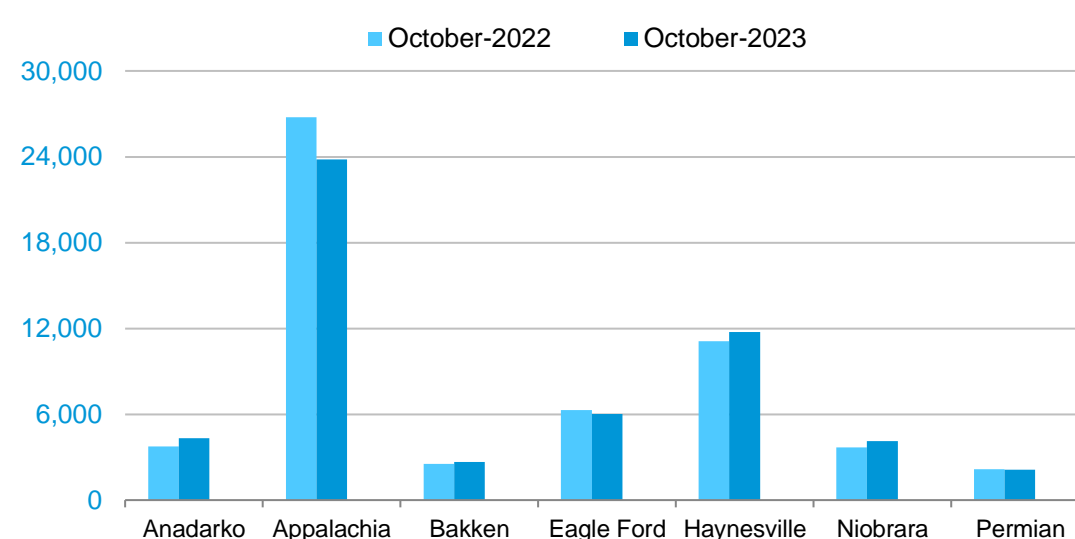
September 2023

drilling data through August
projected production through October

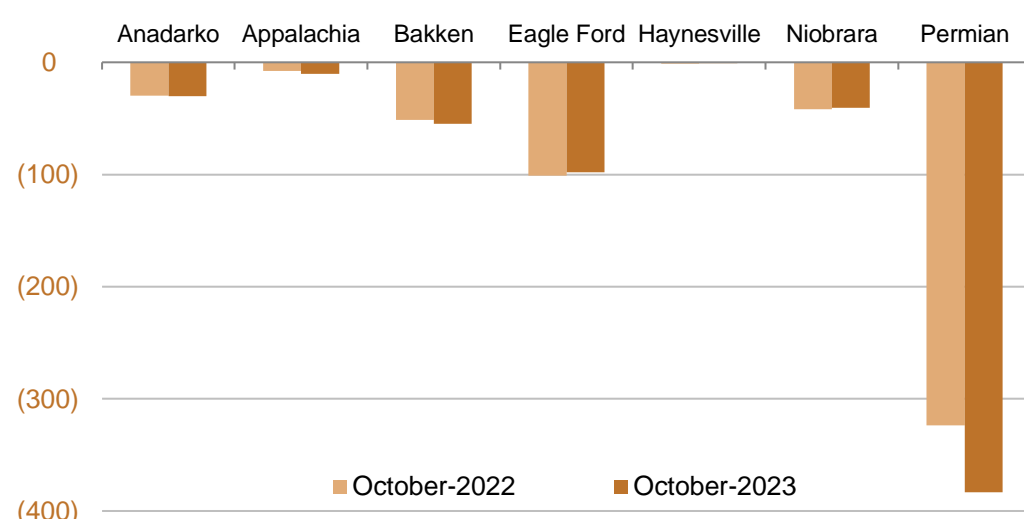
New-well oil production per rig
barrels/day



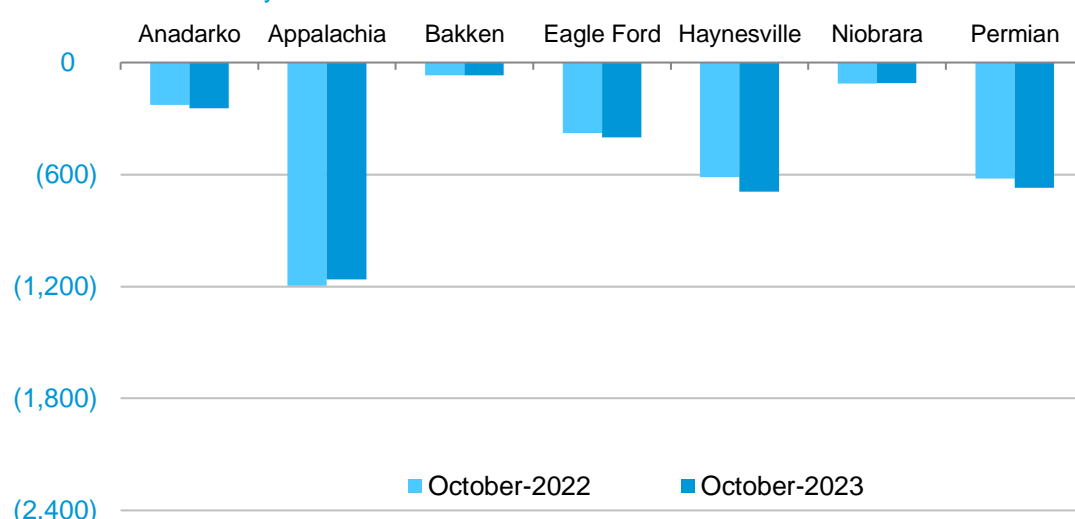
New-well gas production per rig
thousand cubic feet/day



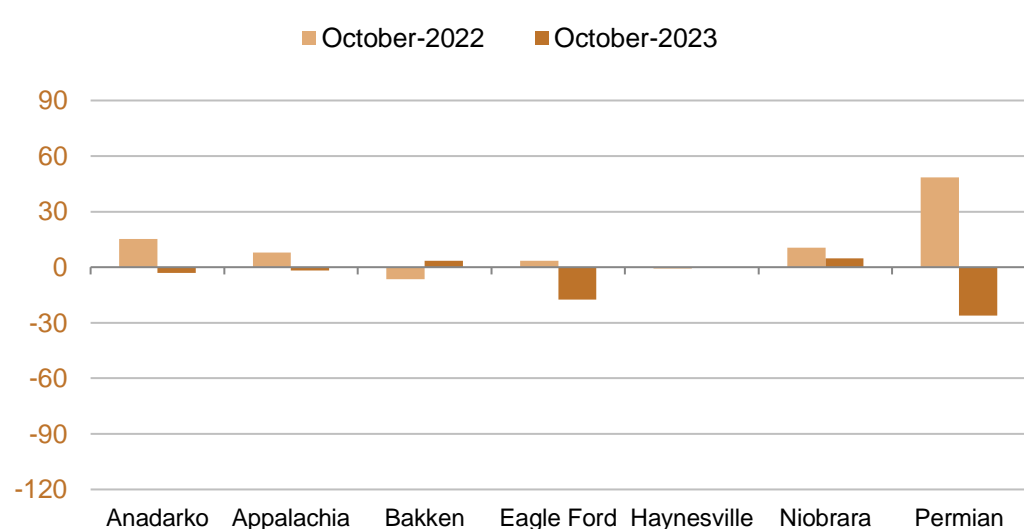
Legacy oil production change
thousand barrels/day



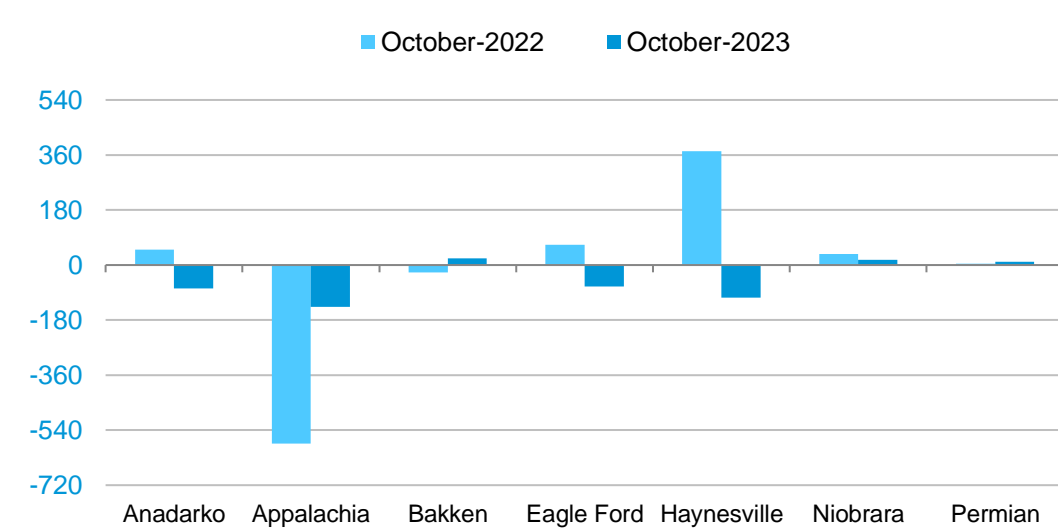
Legacy gas production change
million cubic feet/day



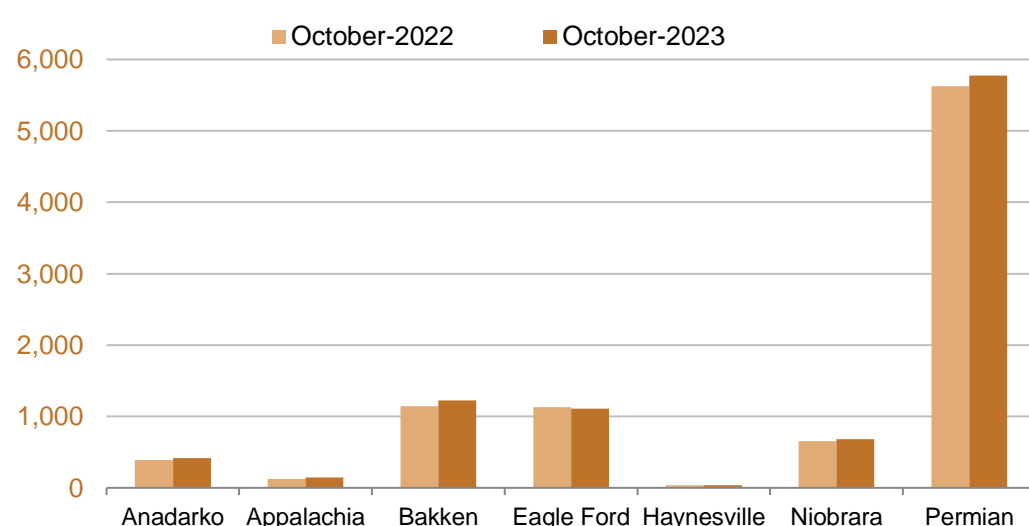
Indicated monthly change in oil production (Oct vs. Sep)
thousand barrels/day



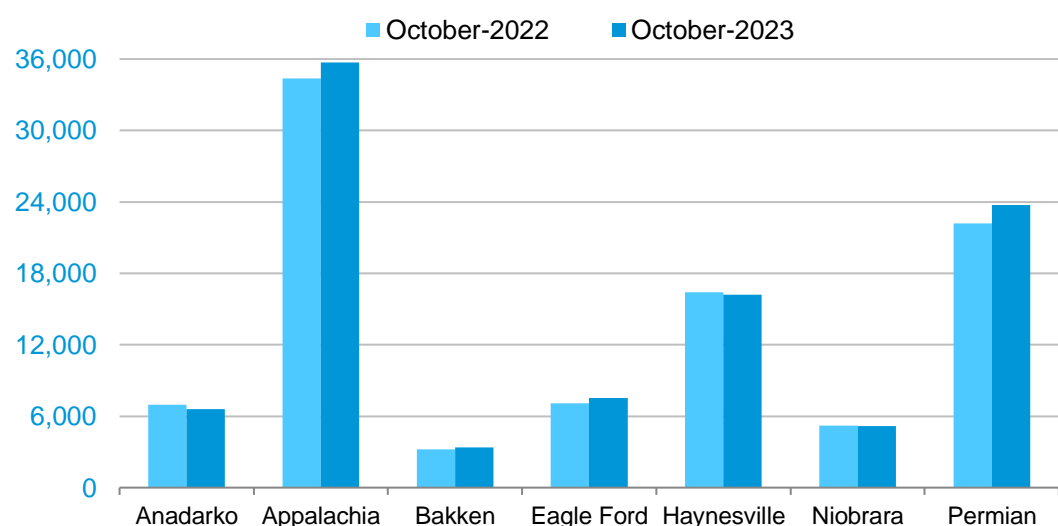
Indicated monthly change in gas production (Oct vs. Sep)
million cubic feet/day



Oil production
thousand barrels/day



Natural gas production
million cubic feet/day





Anadarko Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October

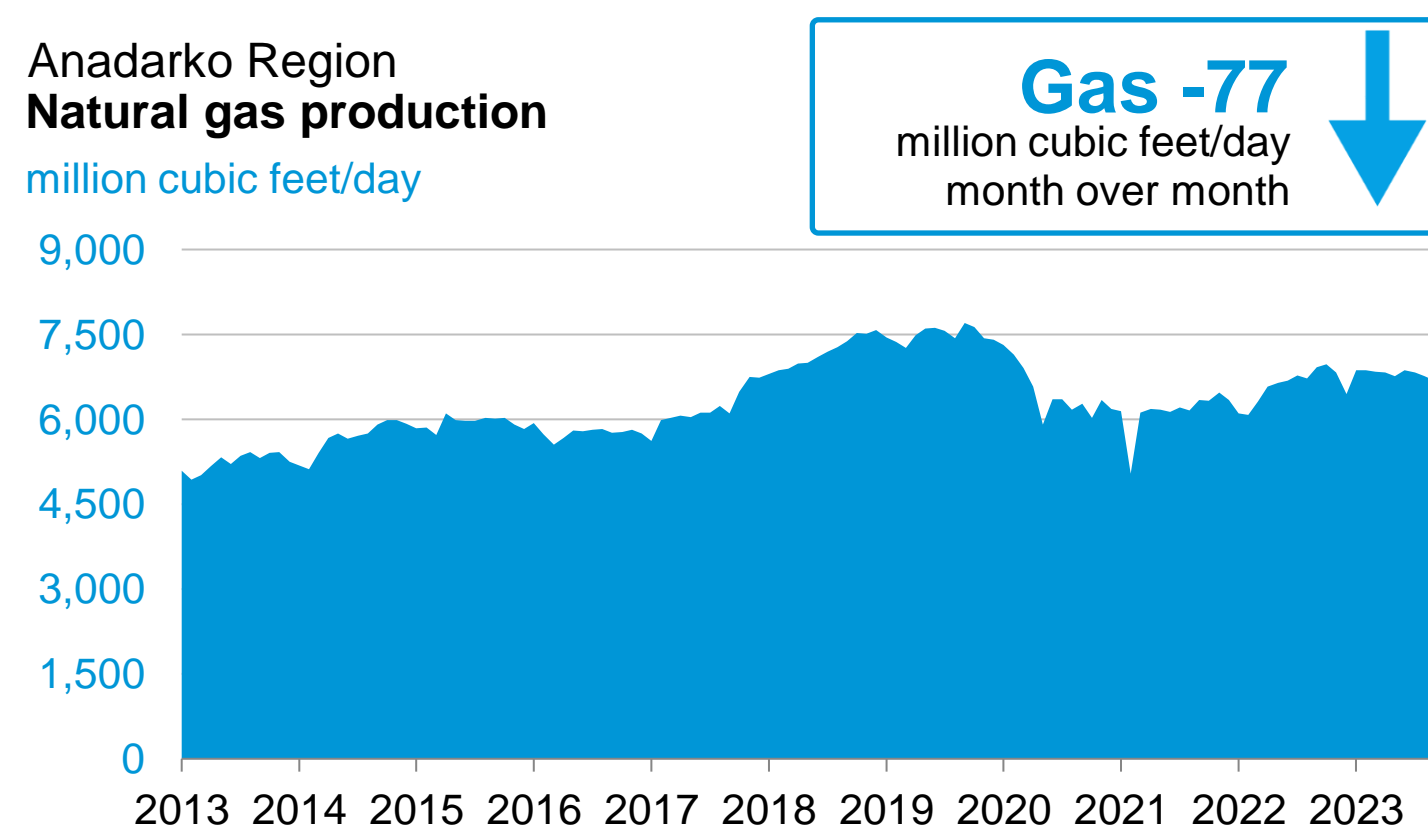
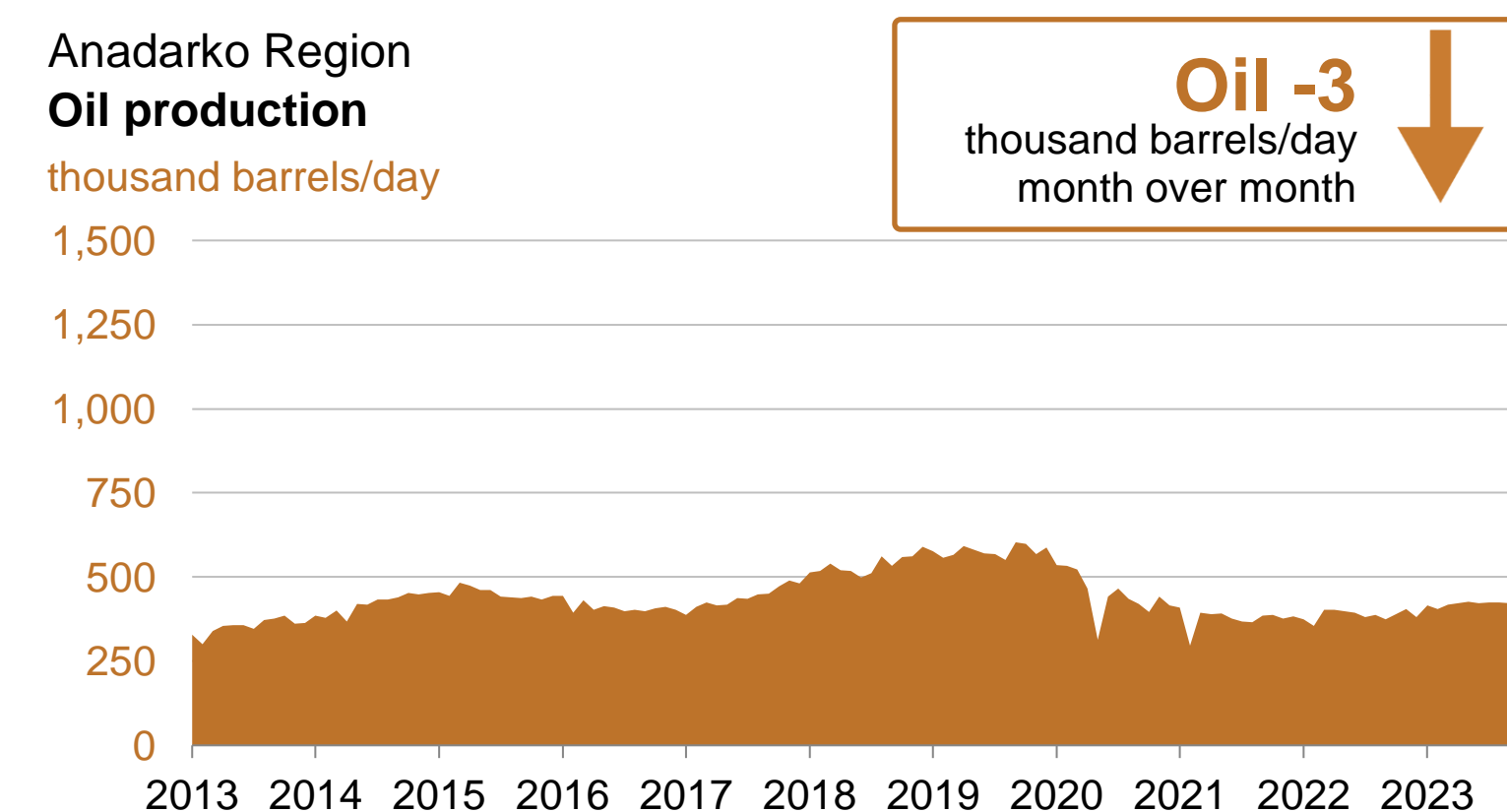
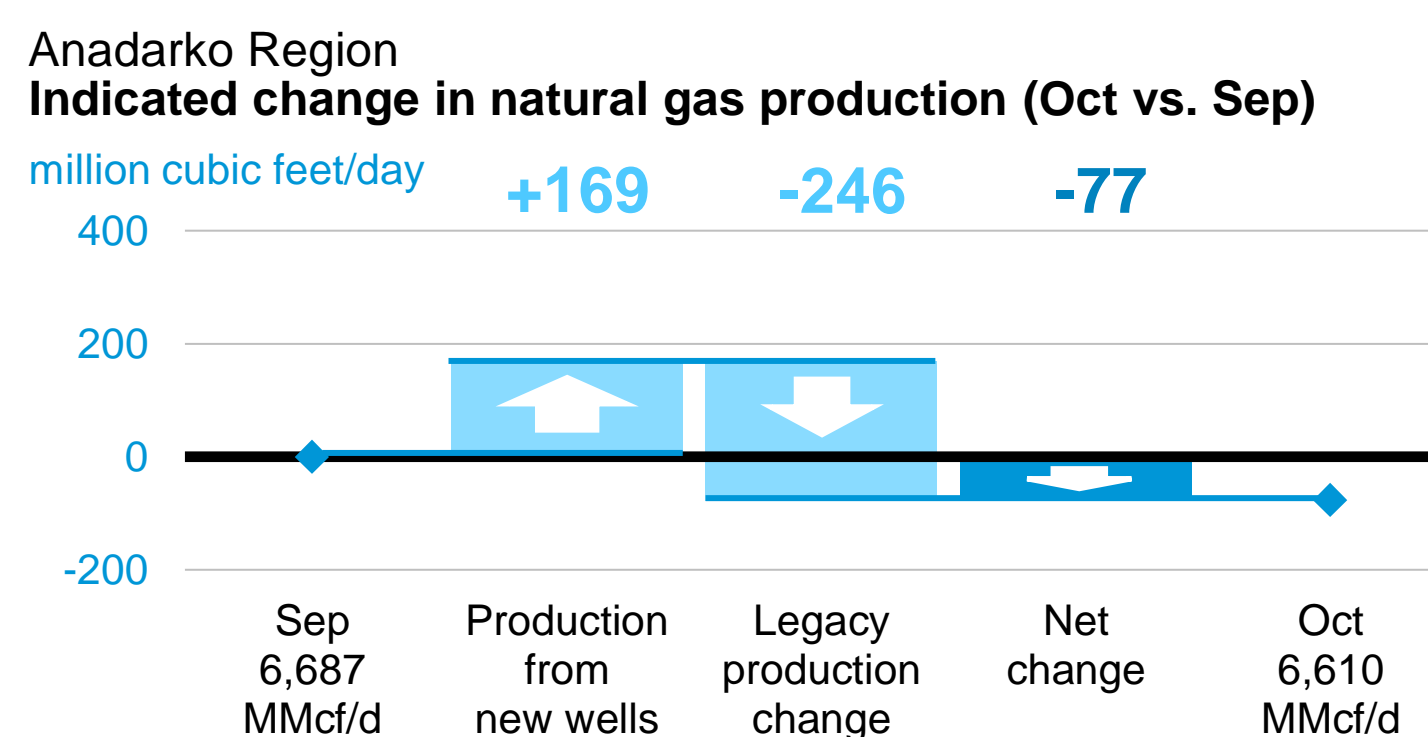
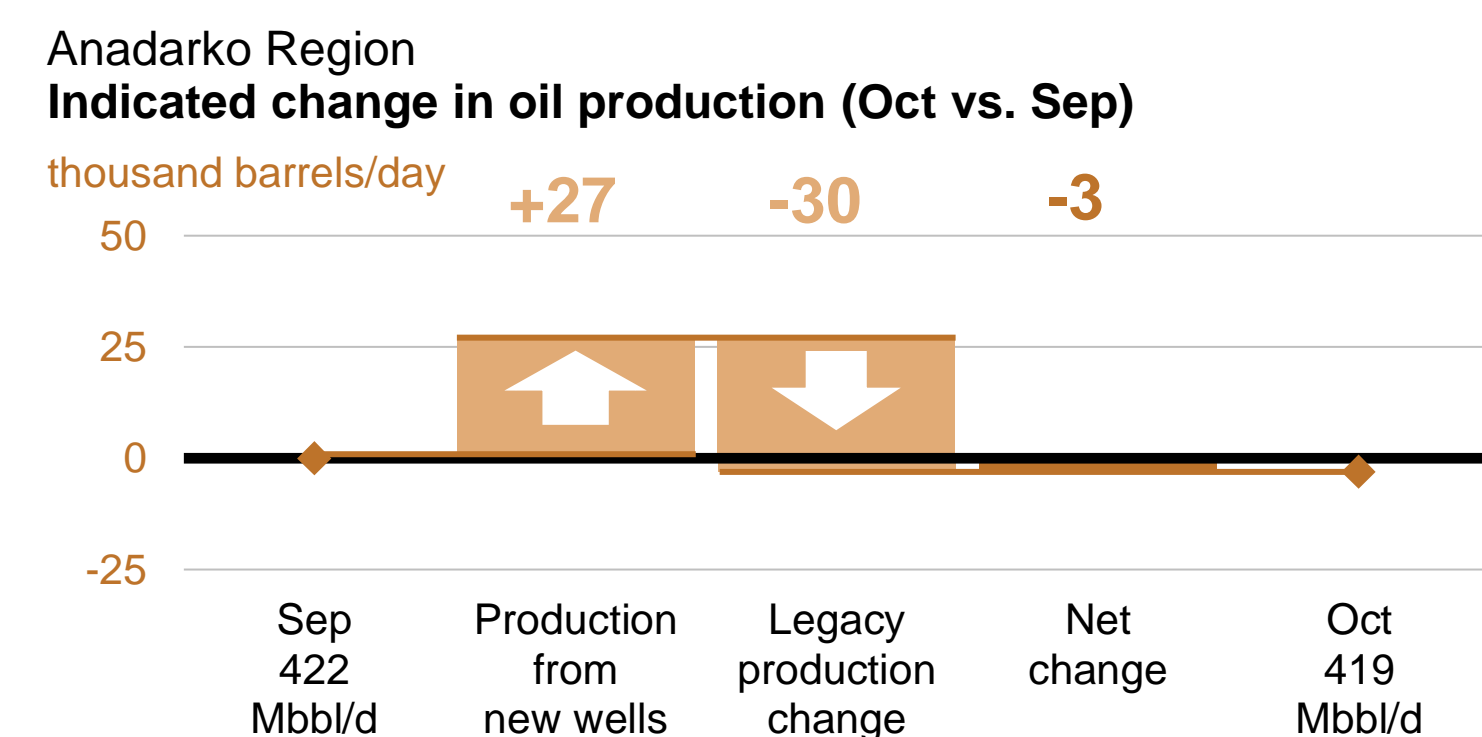
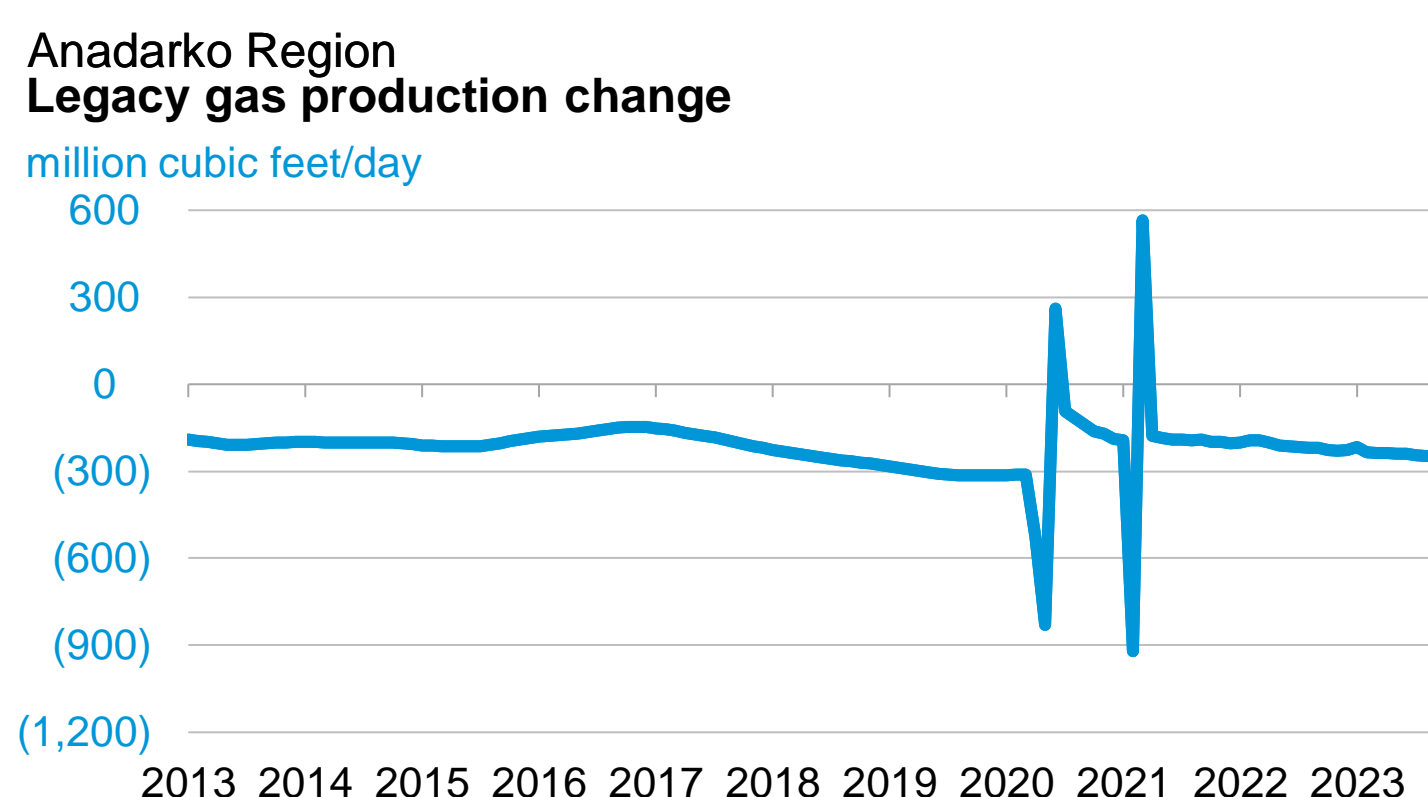
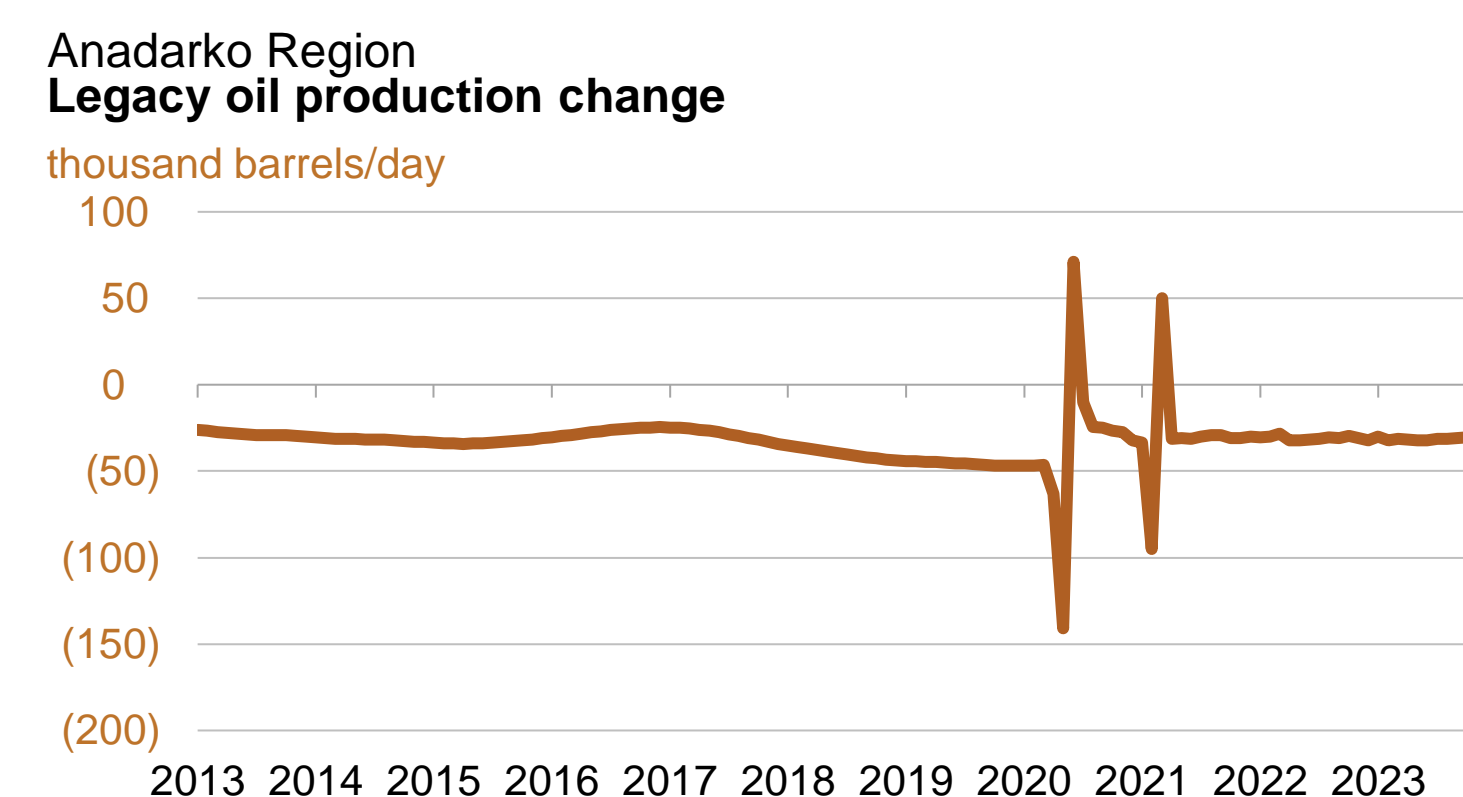
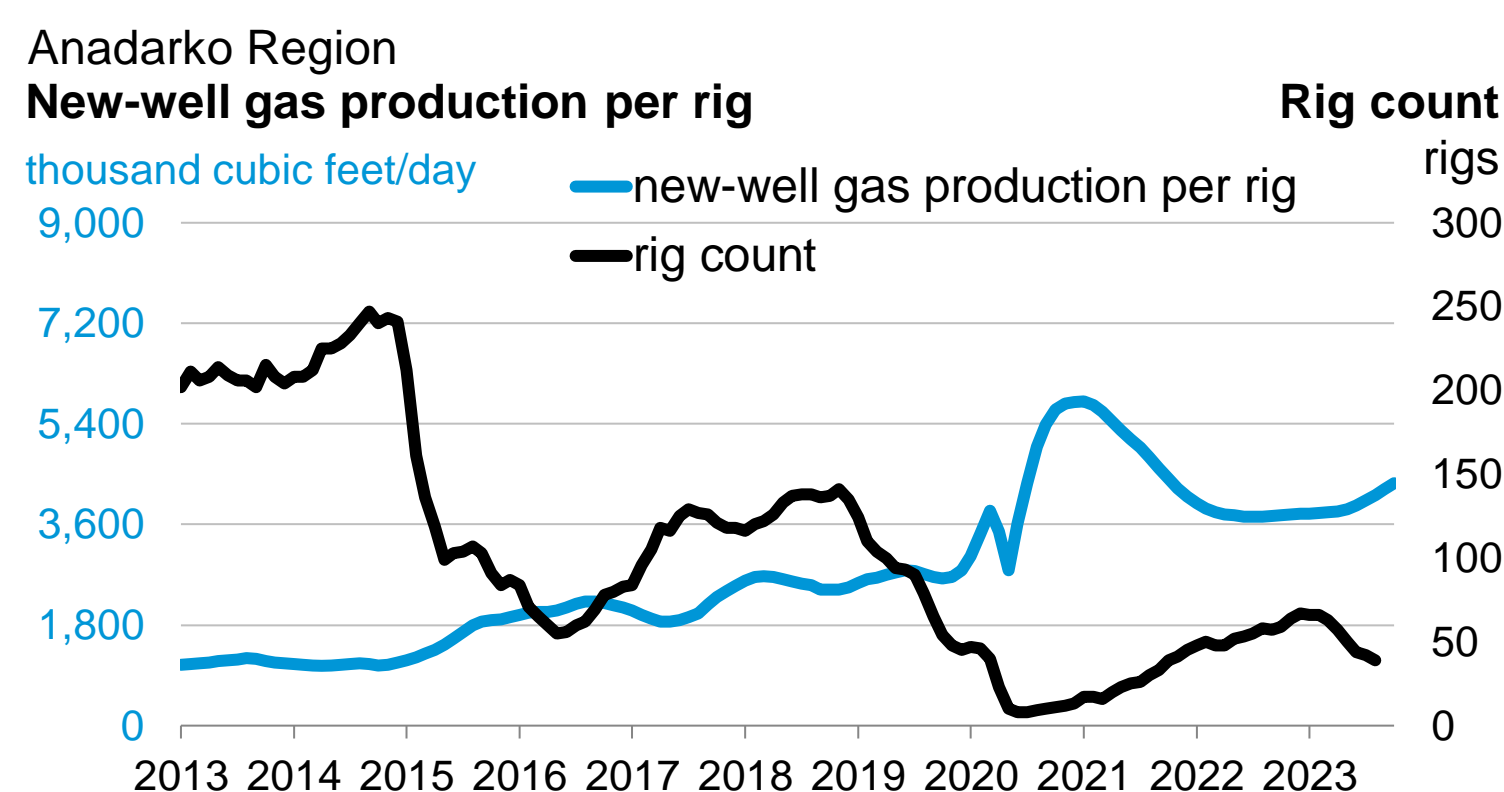
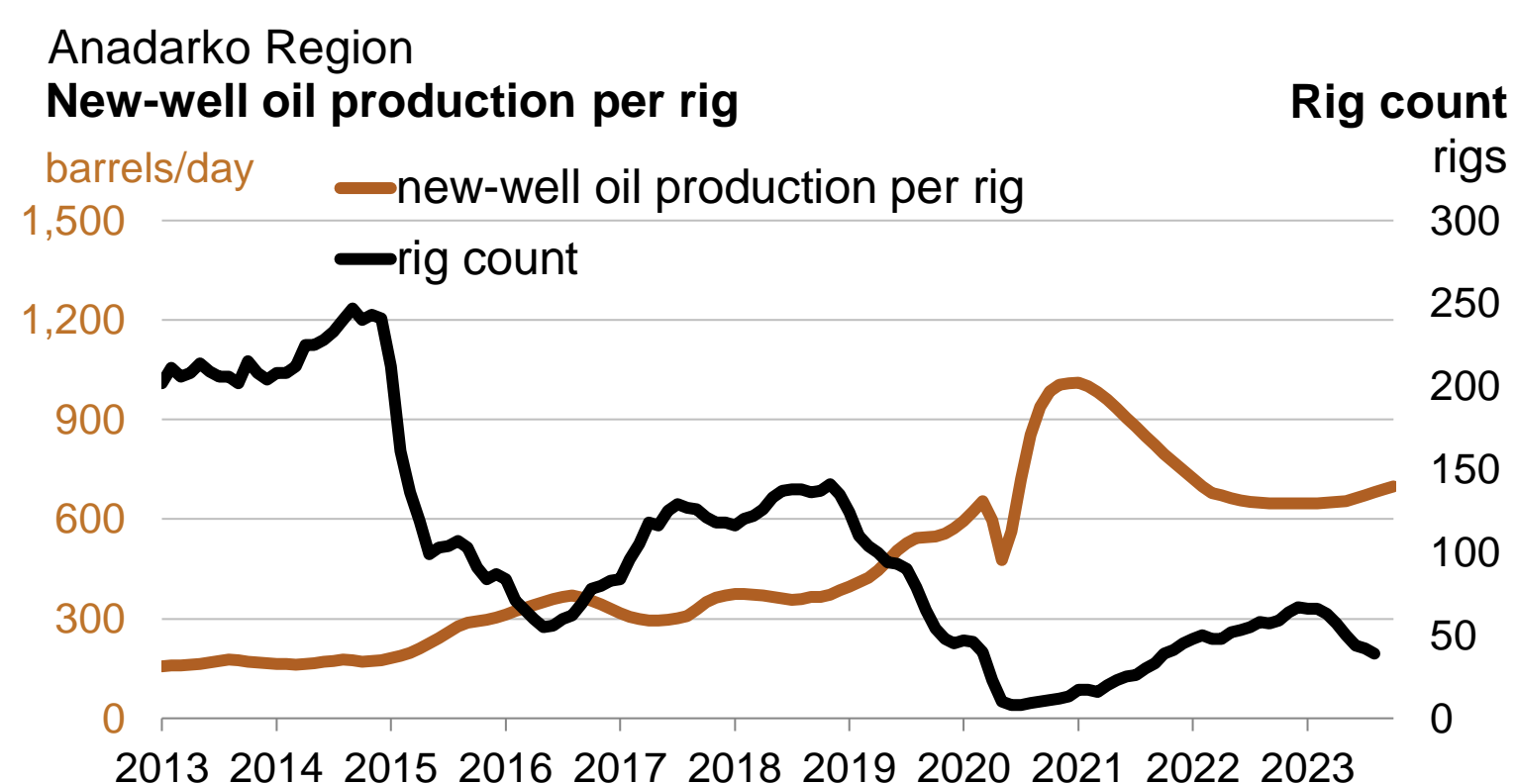
Oil
+9
barrels/day
month over month

699 October
690 September
barrels/day

**Monthly
additions
from one
average rig**

October **4,341**
September **4,235**
thousand cubic feet/day

Gas
+106
thousand cubic feet/day
month over month



eia Appalachia Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October

Oil
0
barrels/day
month over month

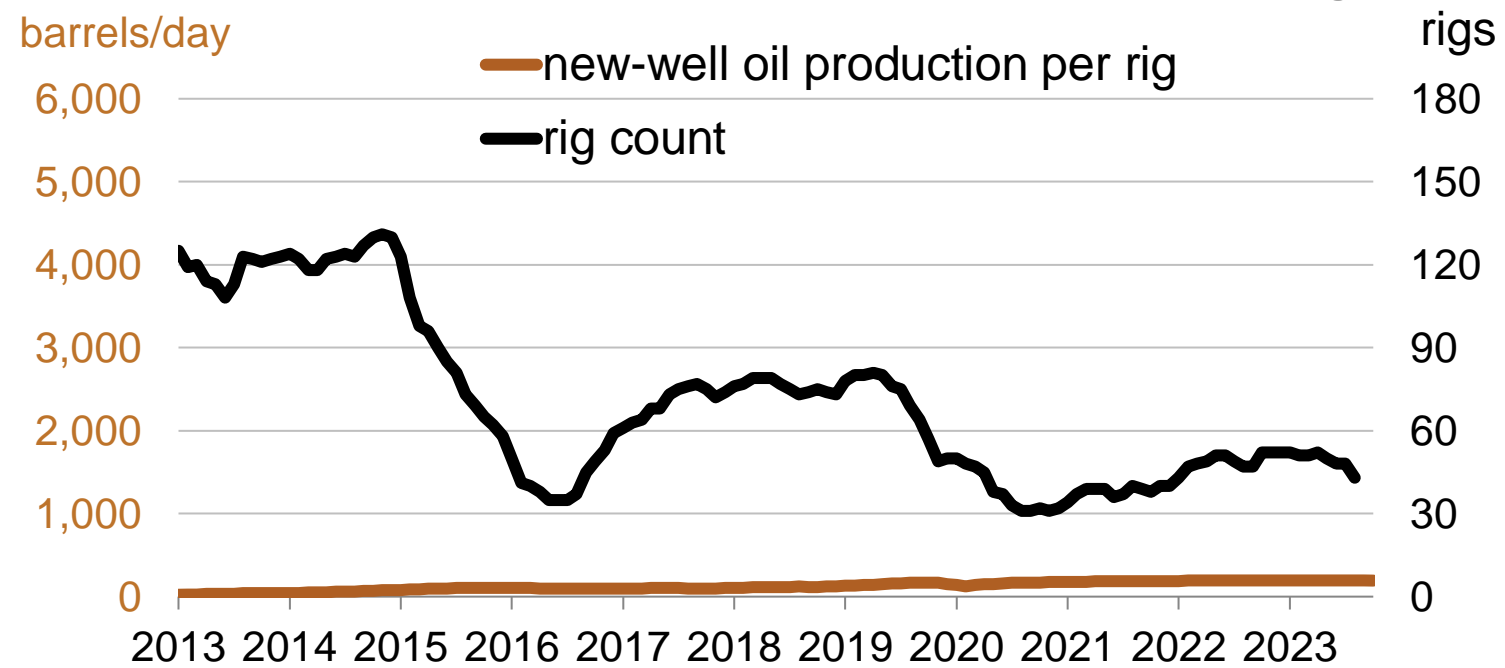
193 October
193 September
barrels/day

**Monthly
additions
from one
average rig**

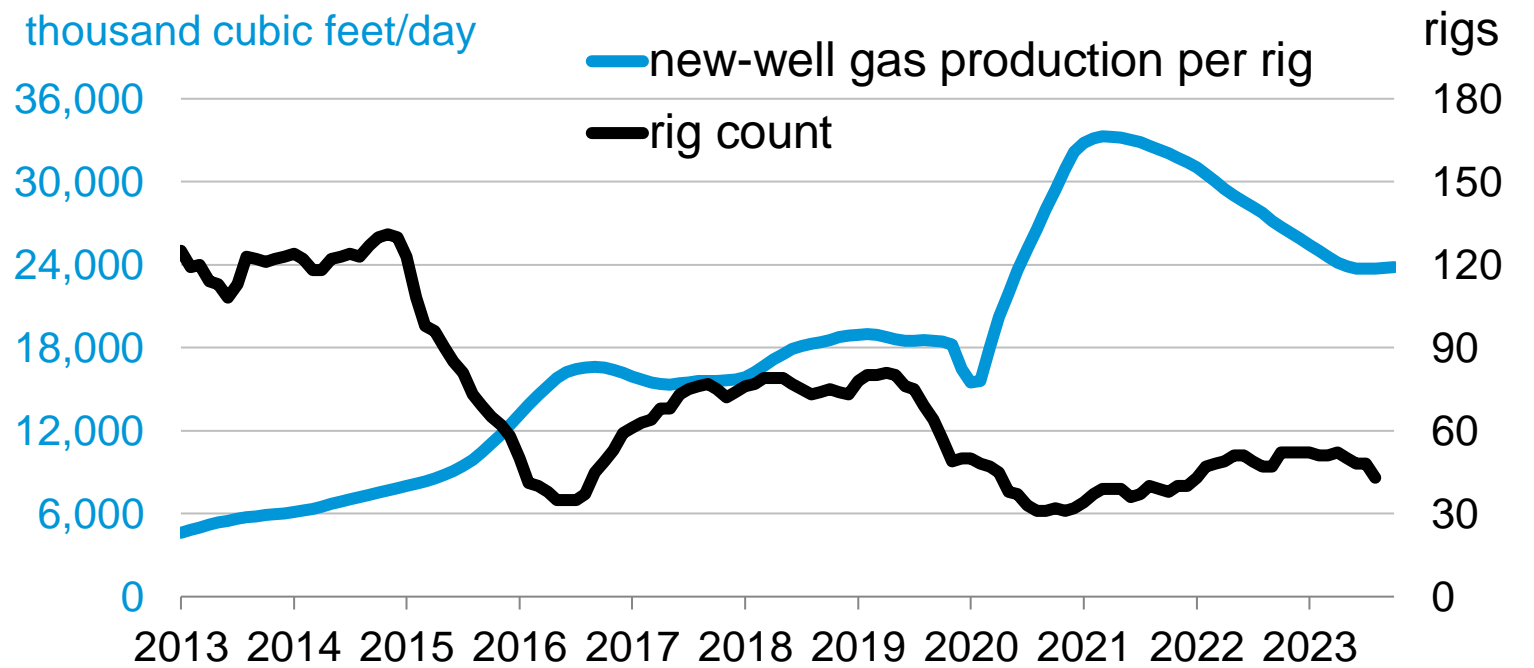
October **23,825**
September **23,782**
thousand cubic feet/day

Gas
+43
thousand cubic feet/day
month over month

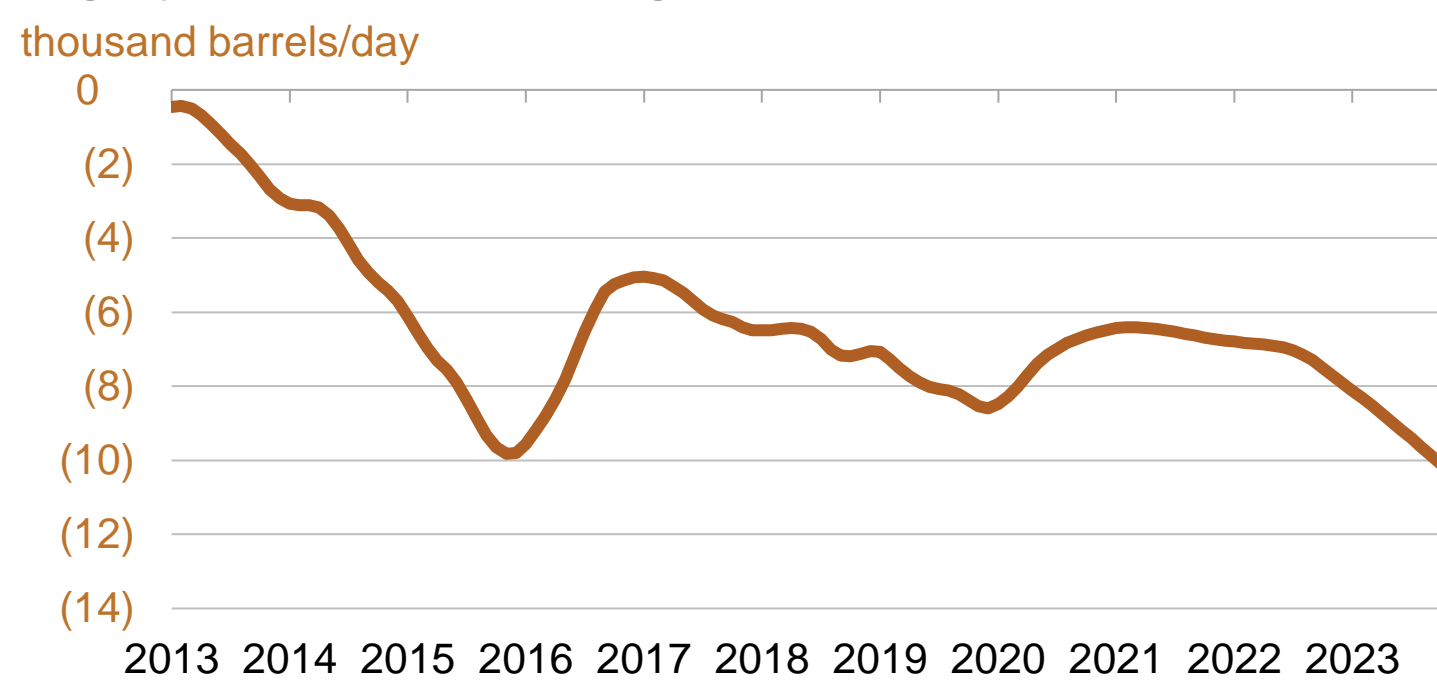
Appalachia Region New-well oil production per rig



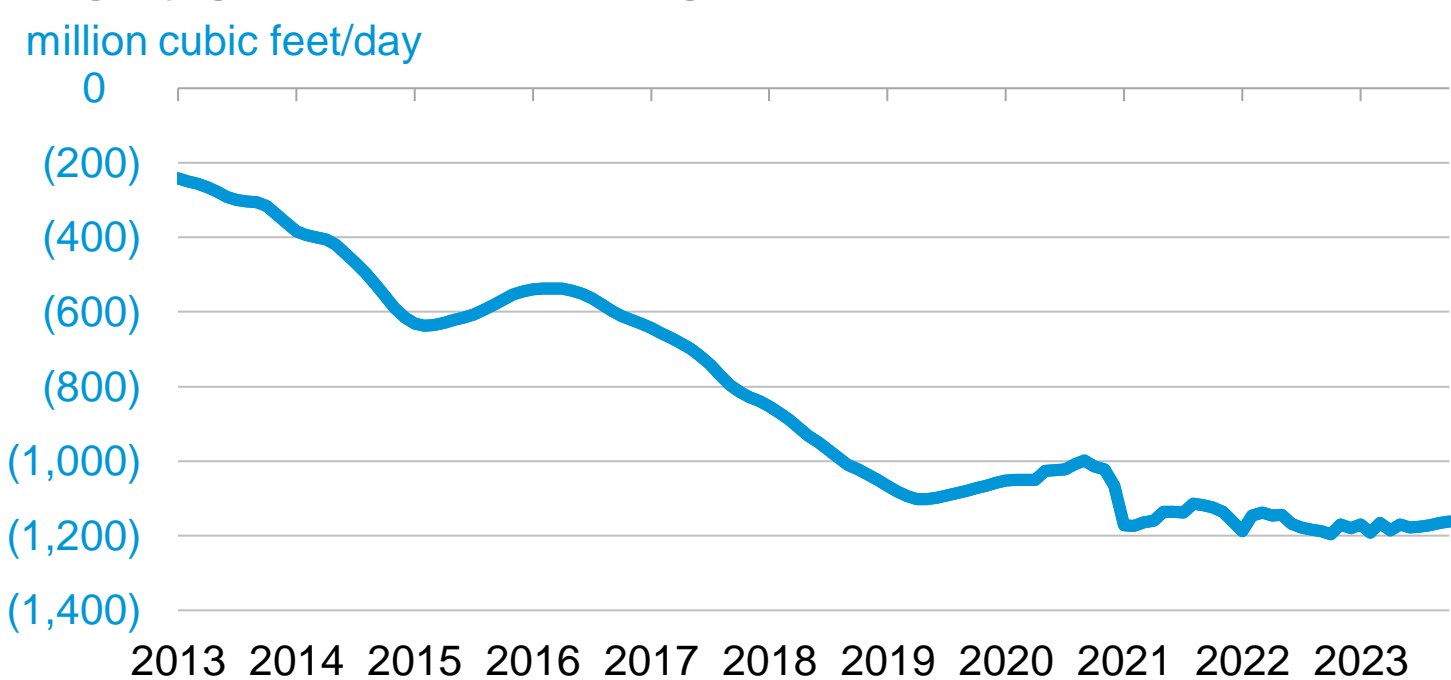
Appalachia Region New-well gas production per rig



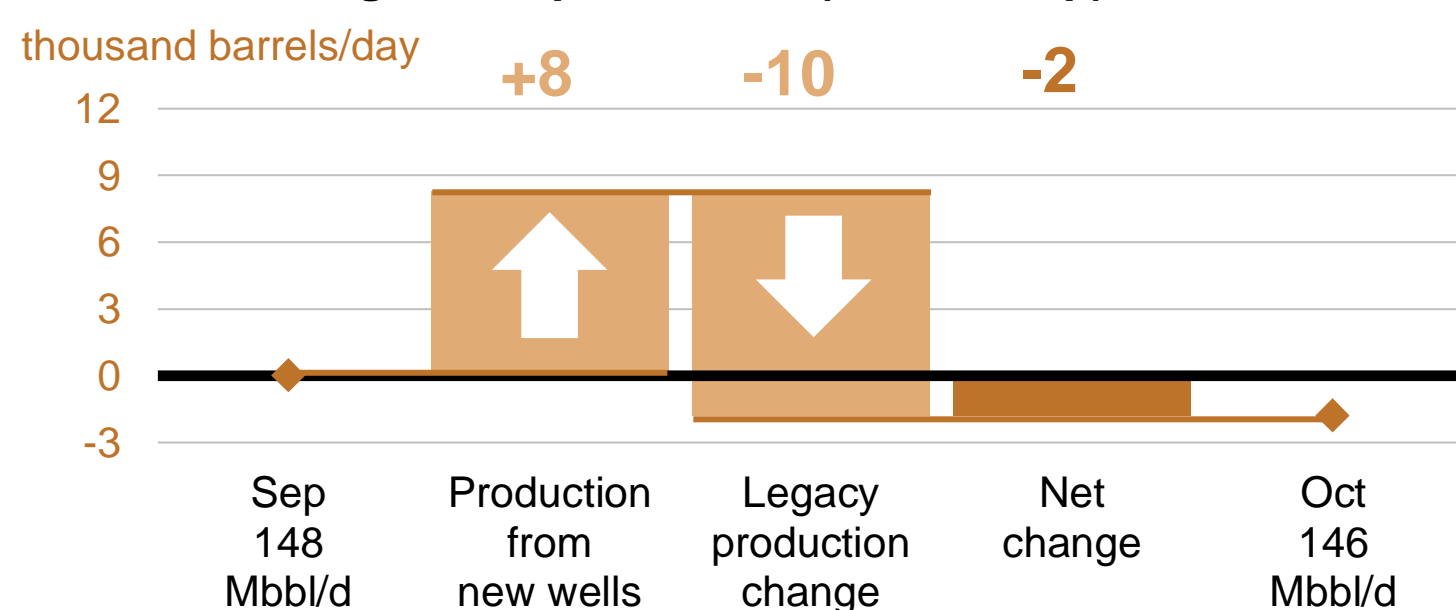
Appalachia Region Legacy oil production change



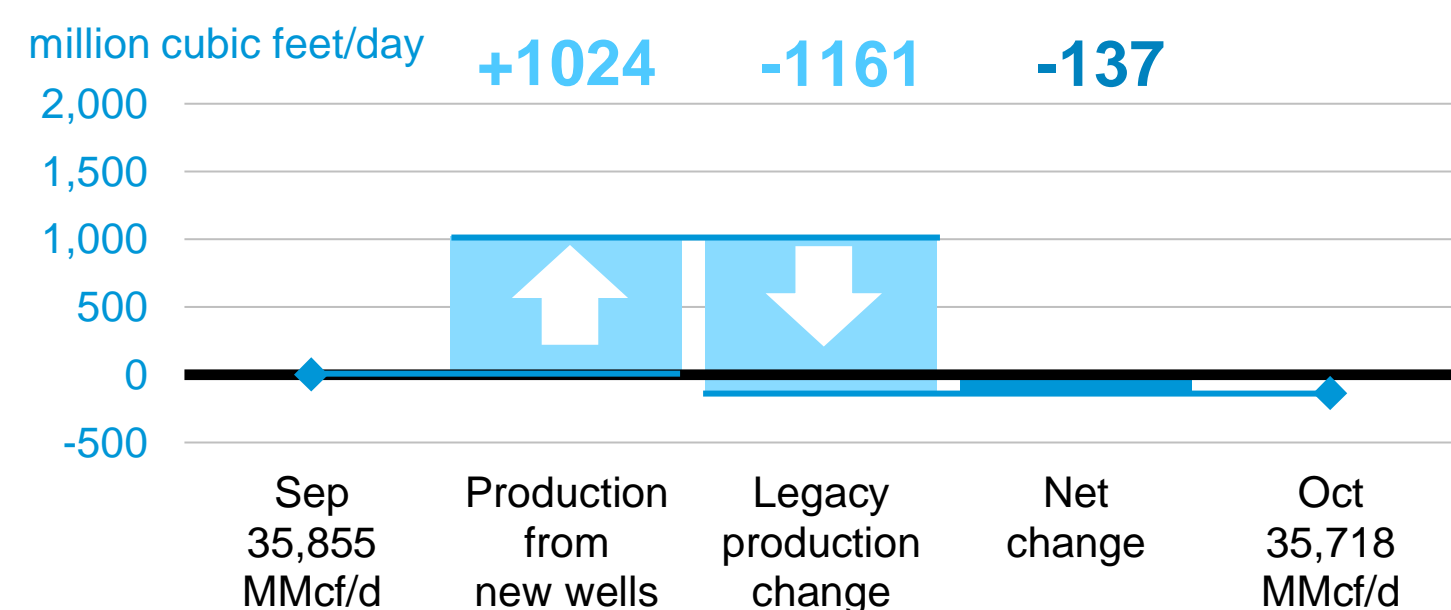
Appalachia Region Legacy gas production change



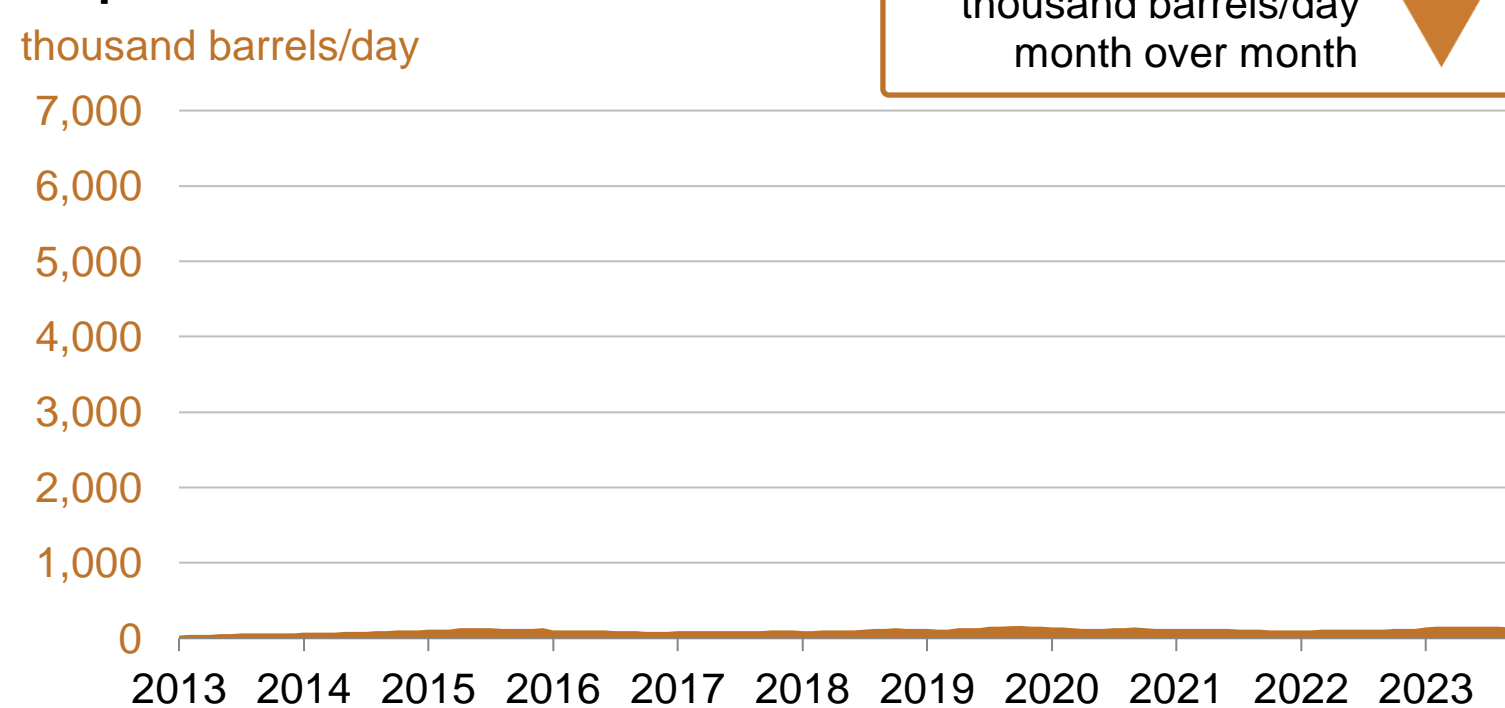
Appalachia Region Indicated change in oil production (Oct vs. Sep)



Appalachia Region Indicated change in natural gas production (Oct vs. Sep)

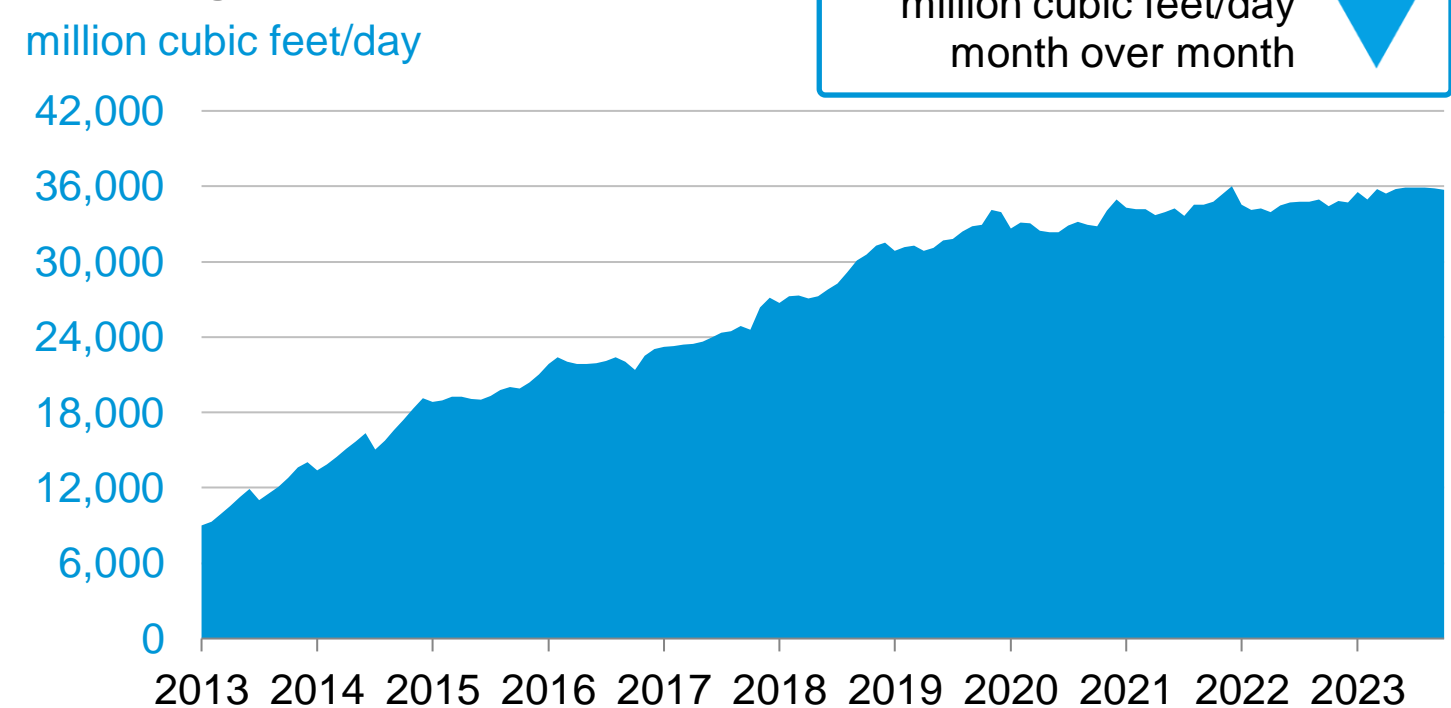


Appalachia Region Oil production



Oil -2
thousand barrels/day
month over month

Appalachia Region Natural gas production



Gas -137
million cubic feet/day
month over month

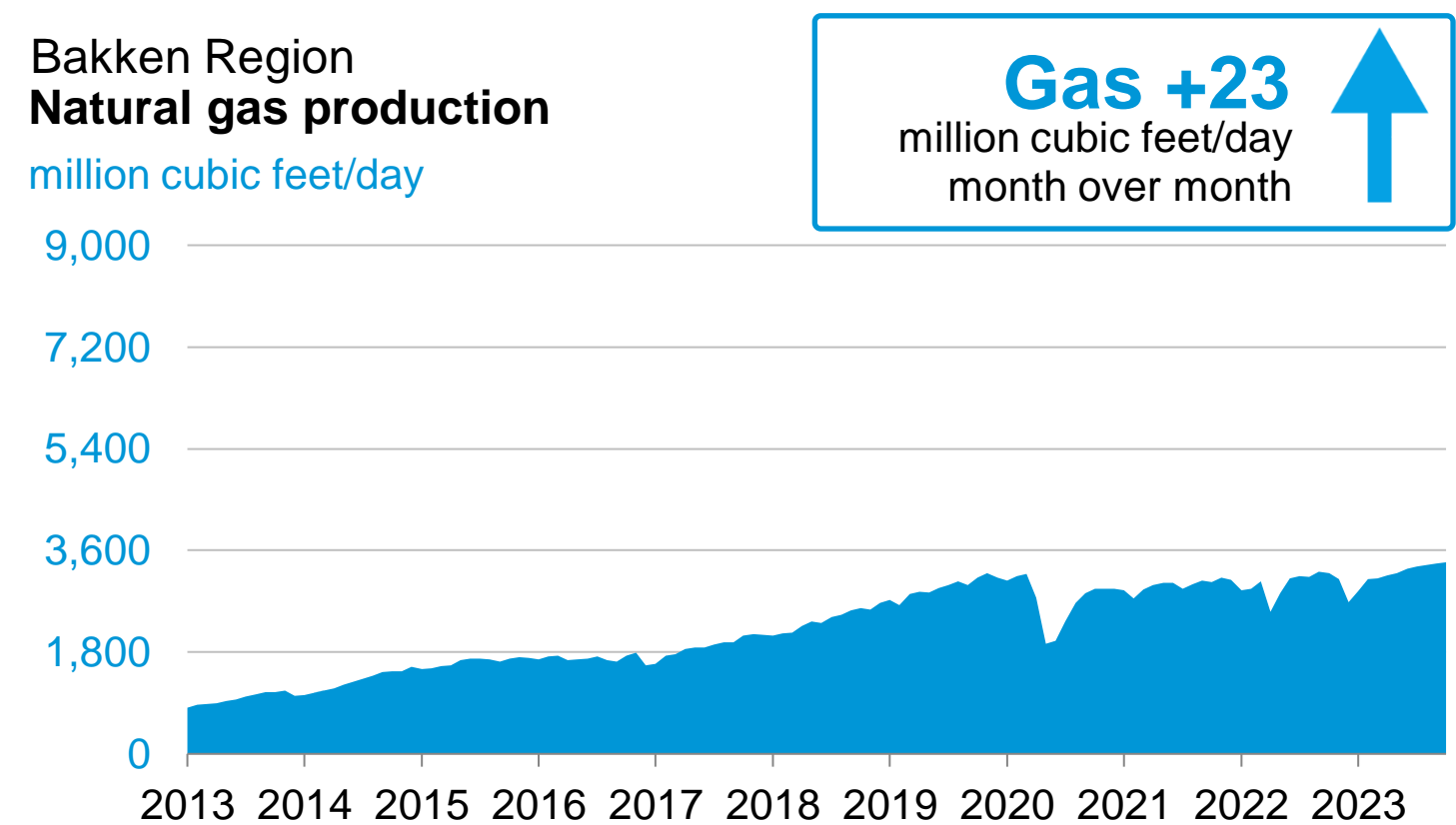
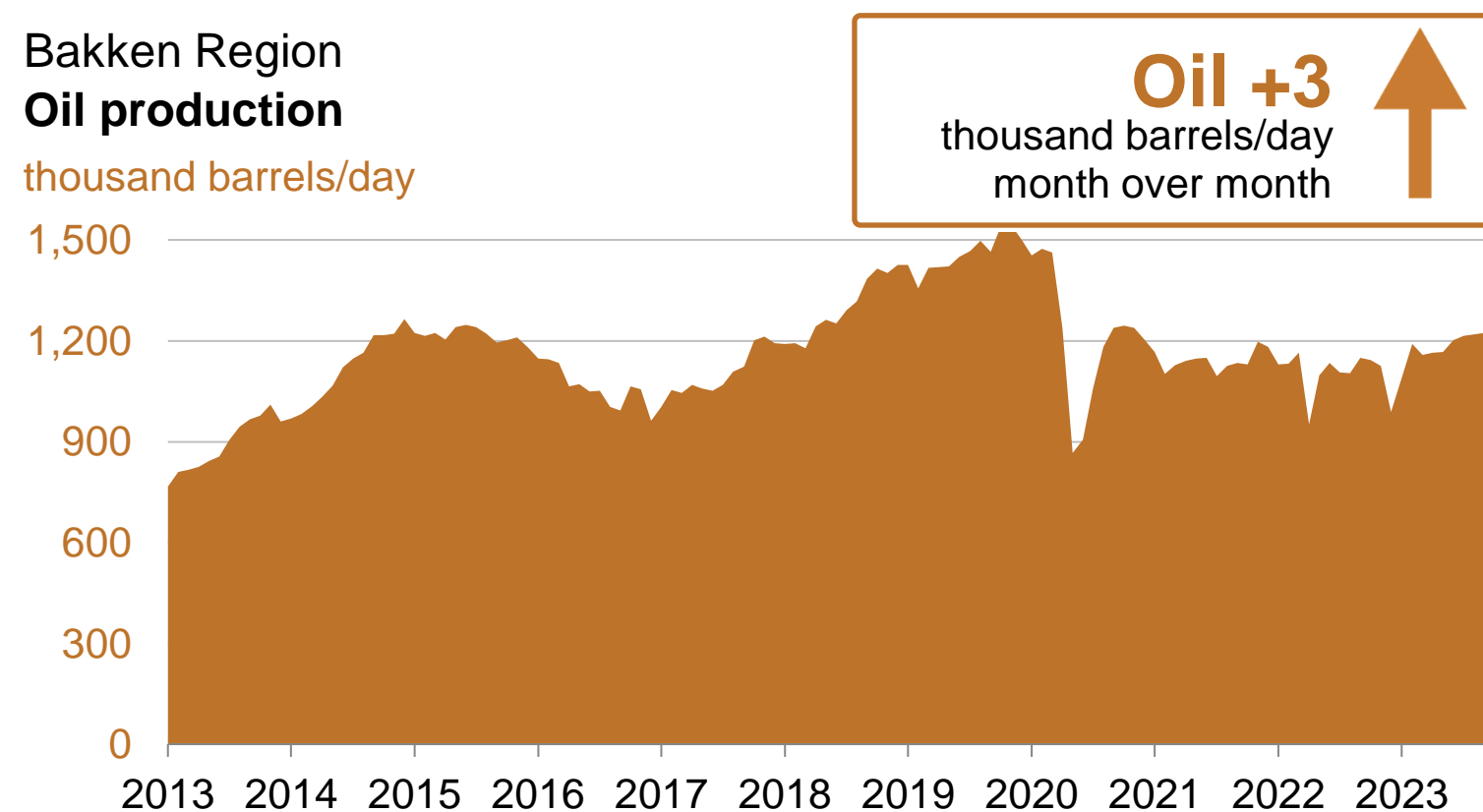
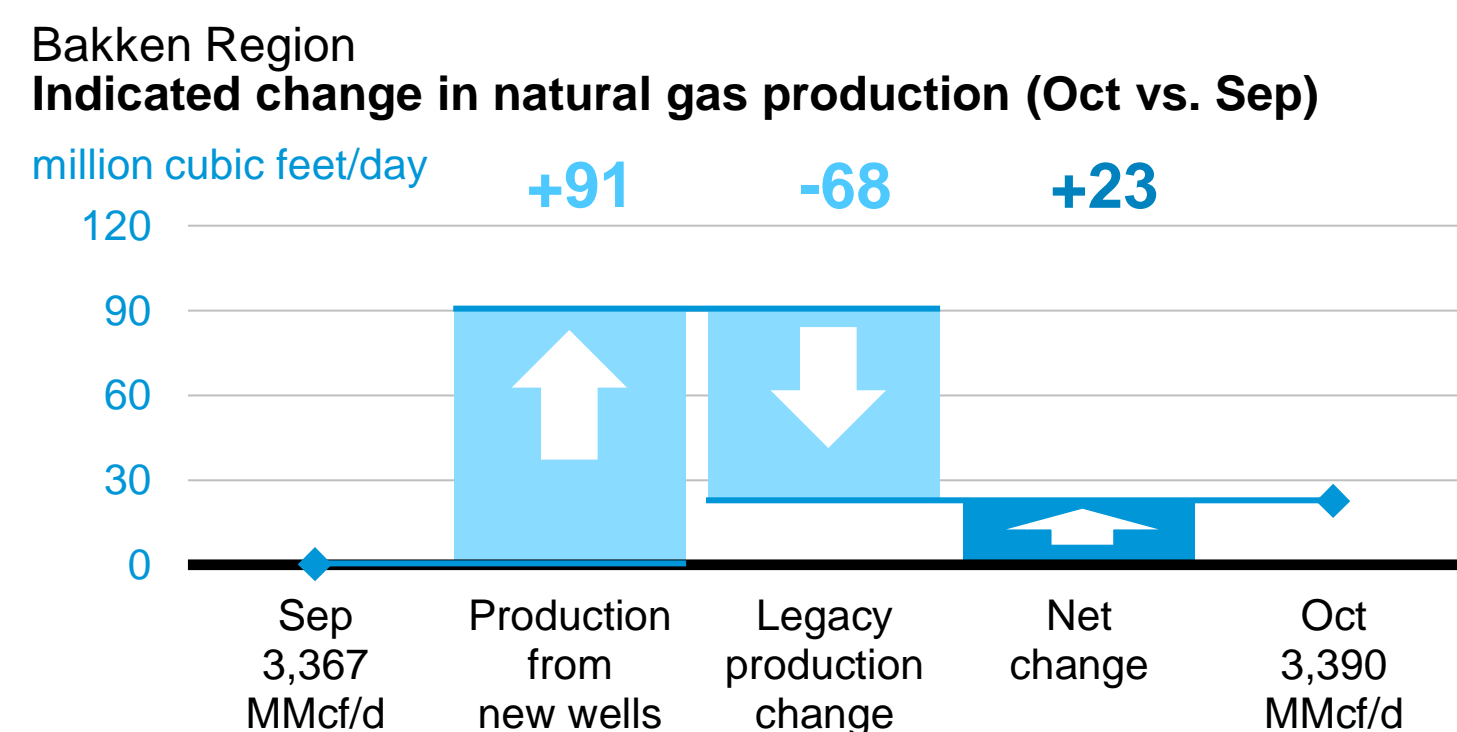
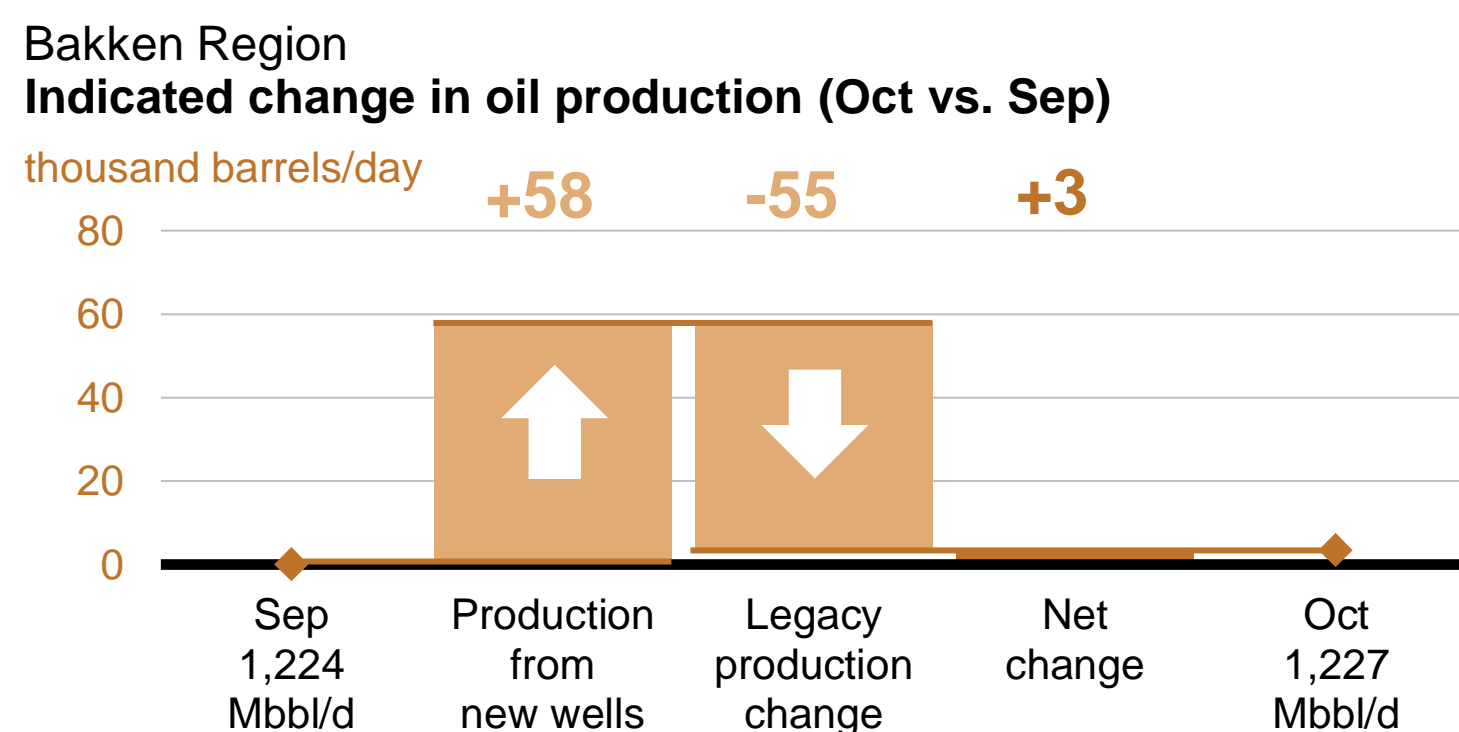
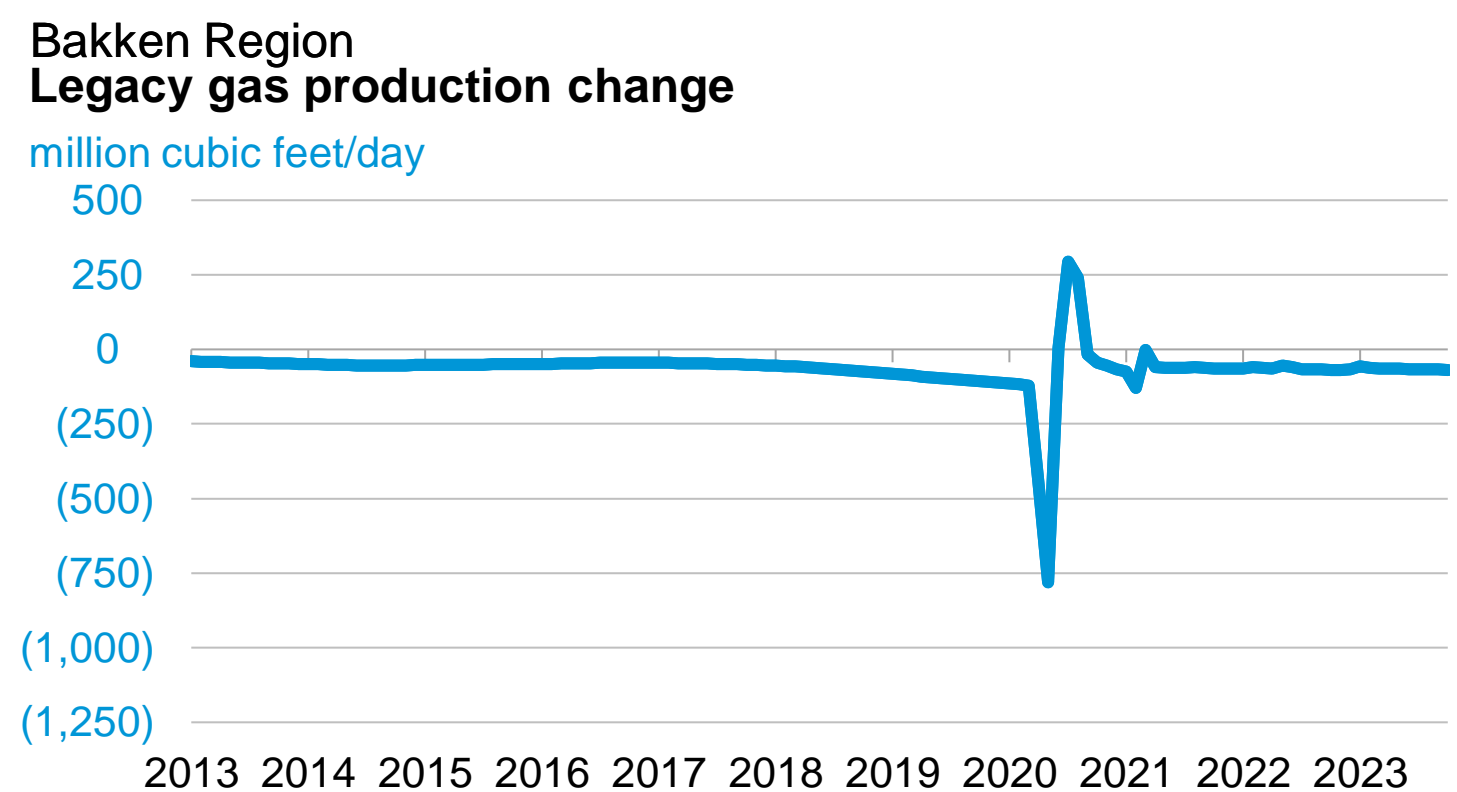
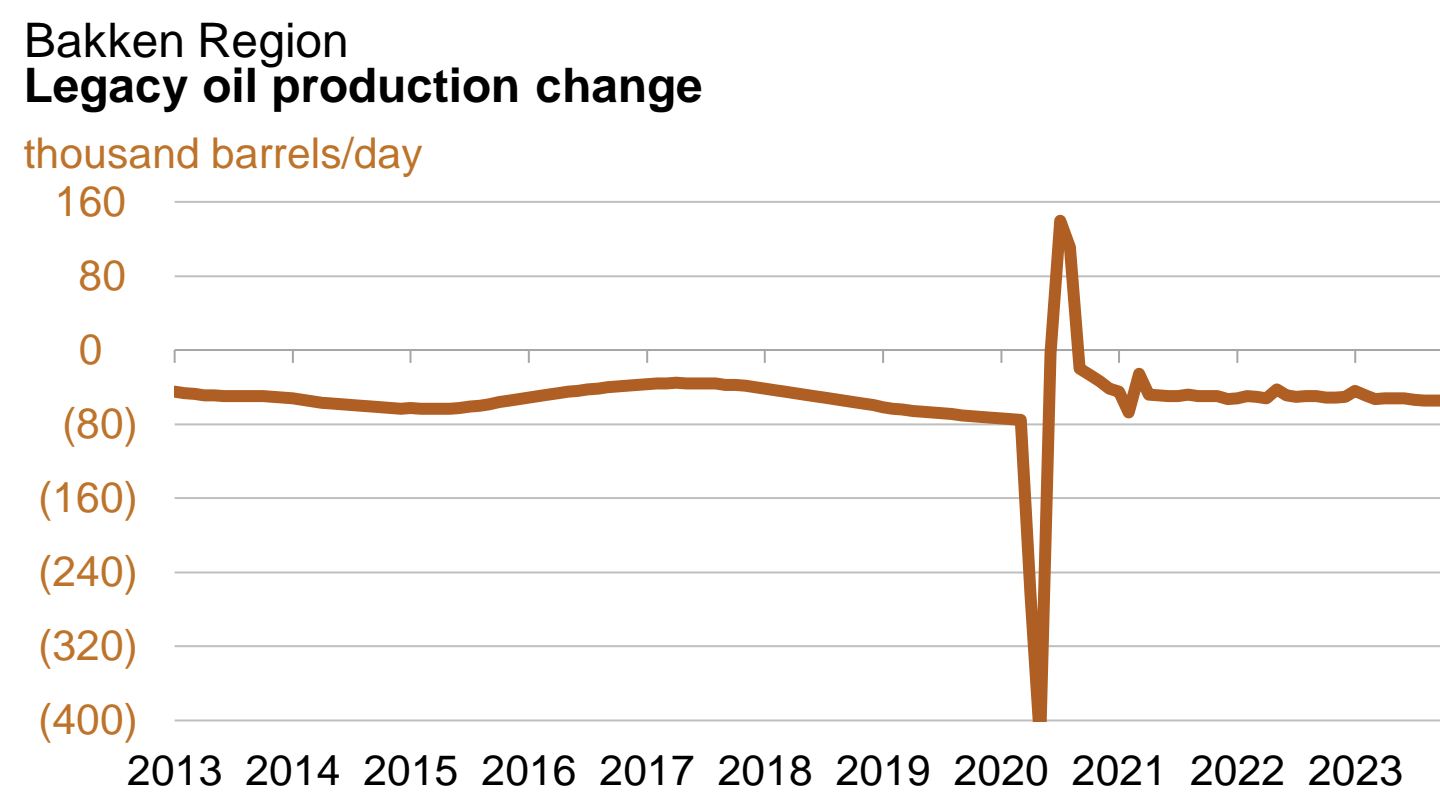
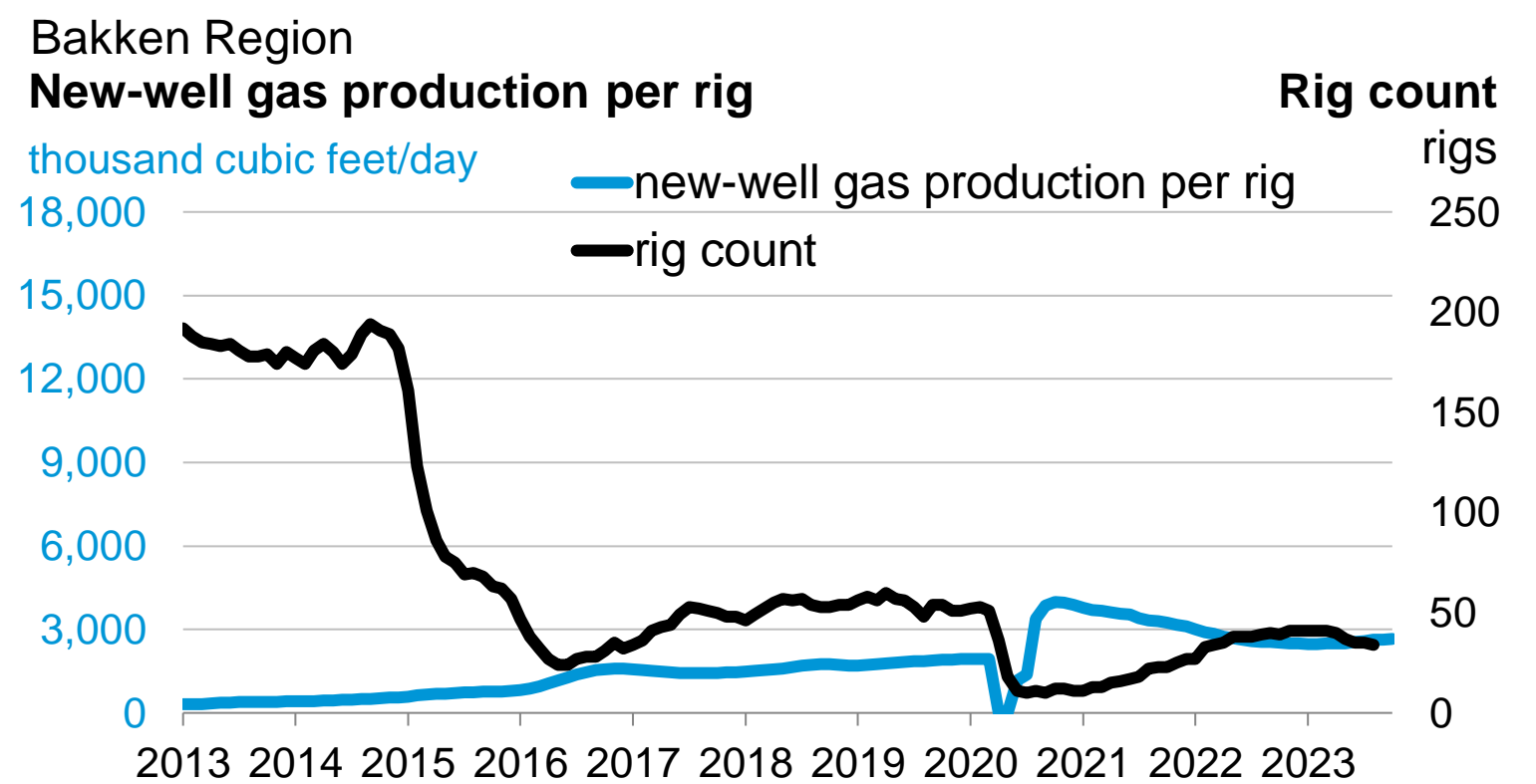
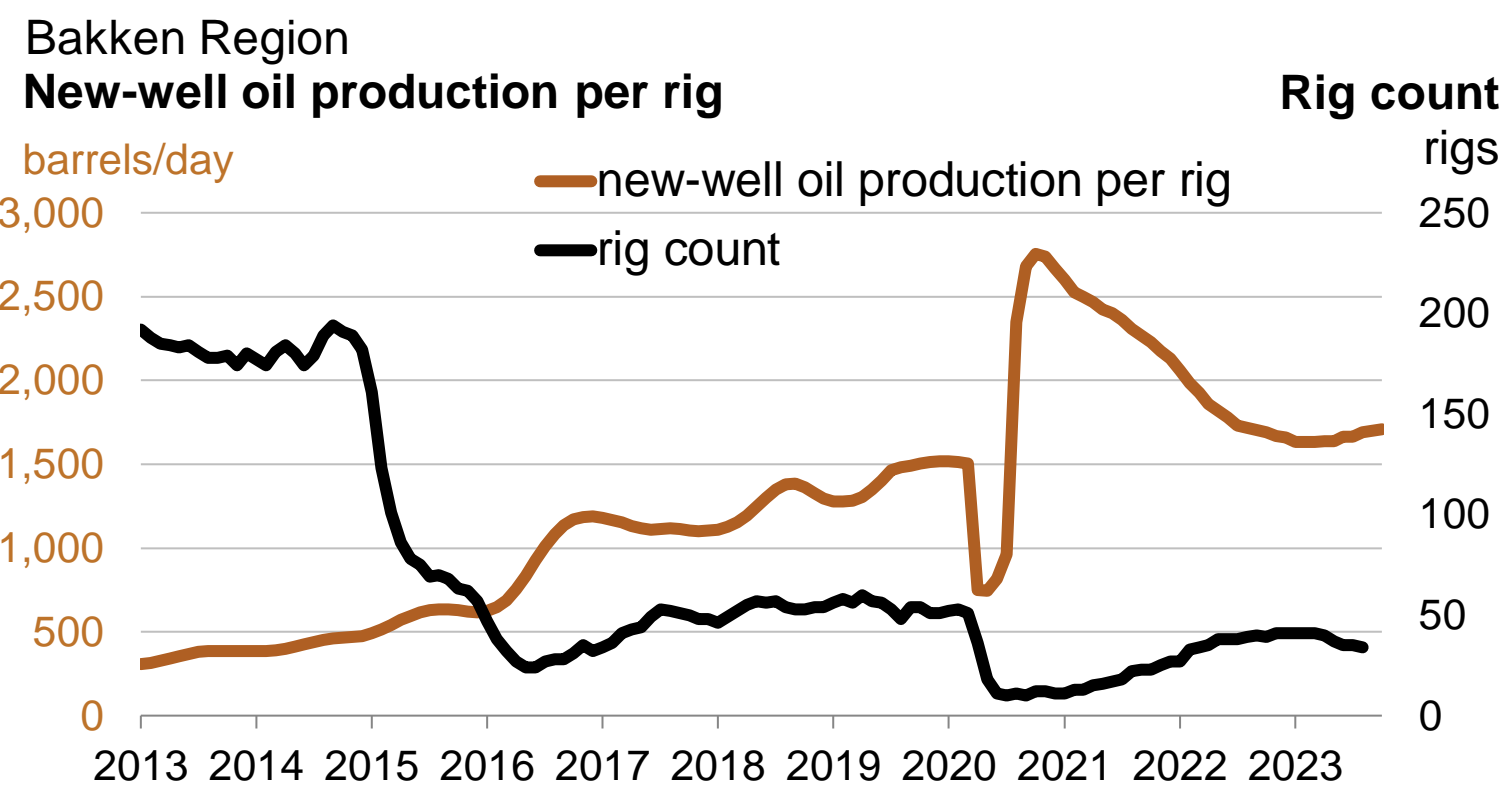


Bakken Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October



eia Eagle Ford Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October

Oil
+14
barrels/day
month over month

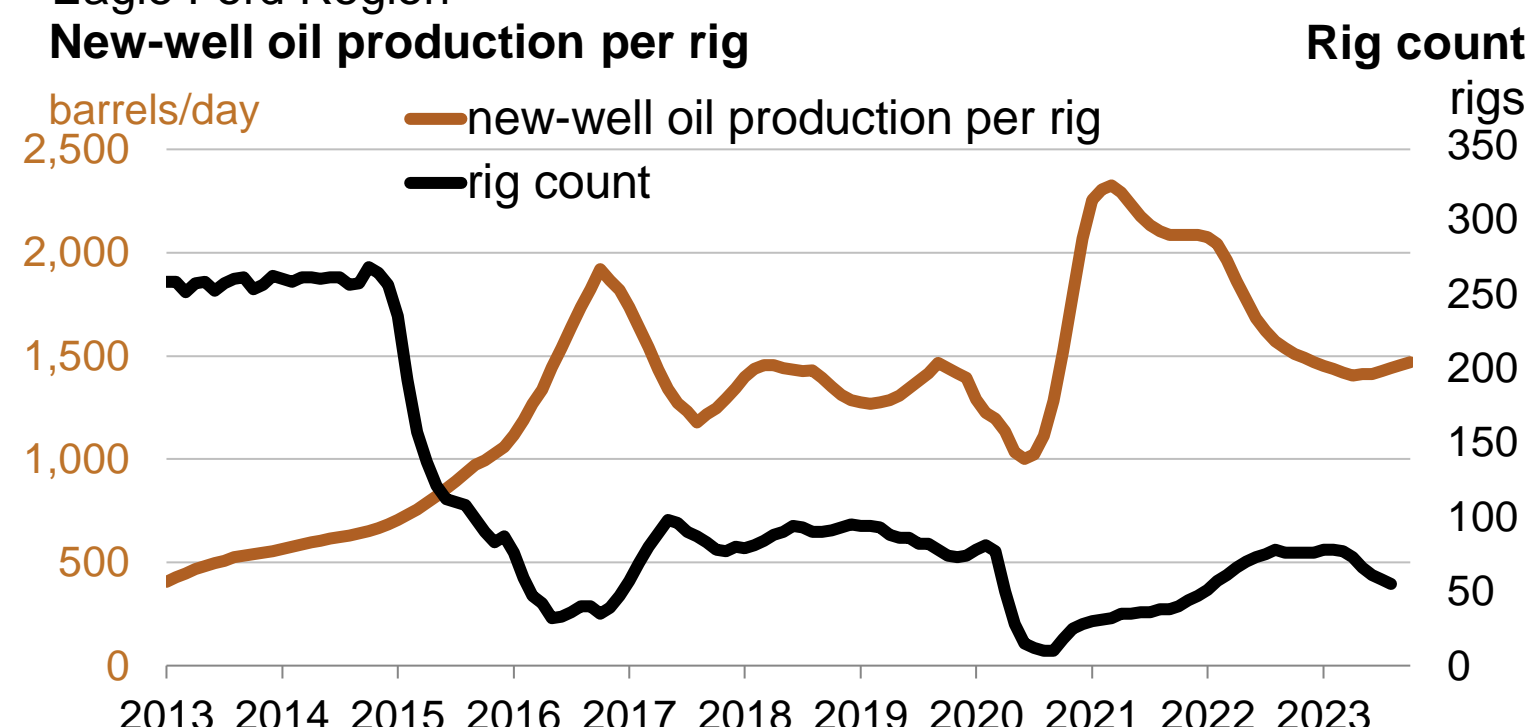
1,469 October
1,455 September
barrels/day

**Monthly
additions
from one
average rig**

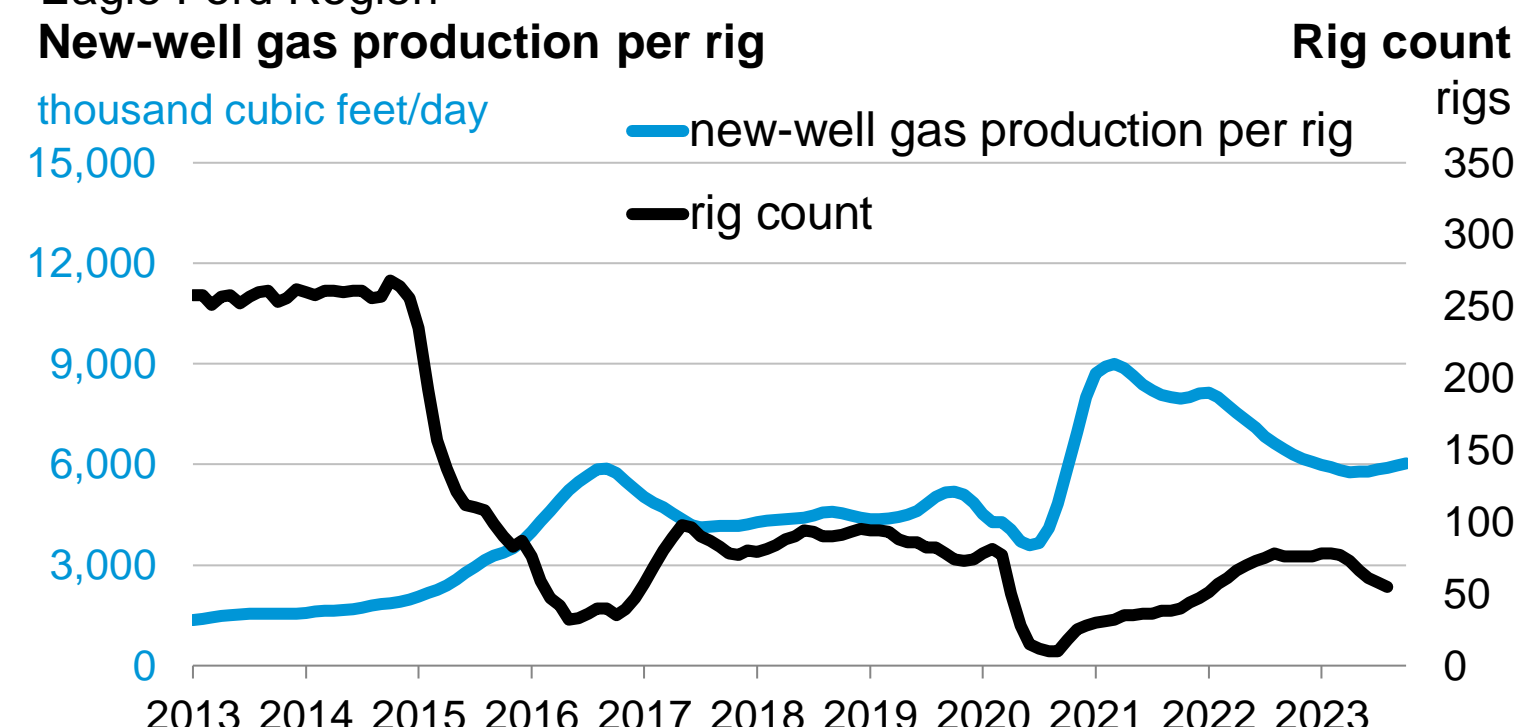
October **6,026**
September **5,966**
thousand cubic feet/day

Gas
+60
thousand cubic feet/day
month over month

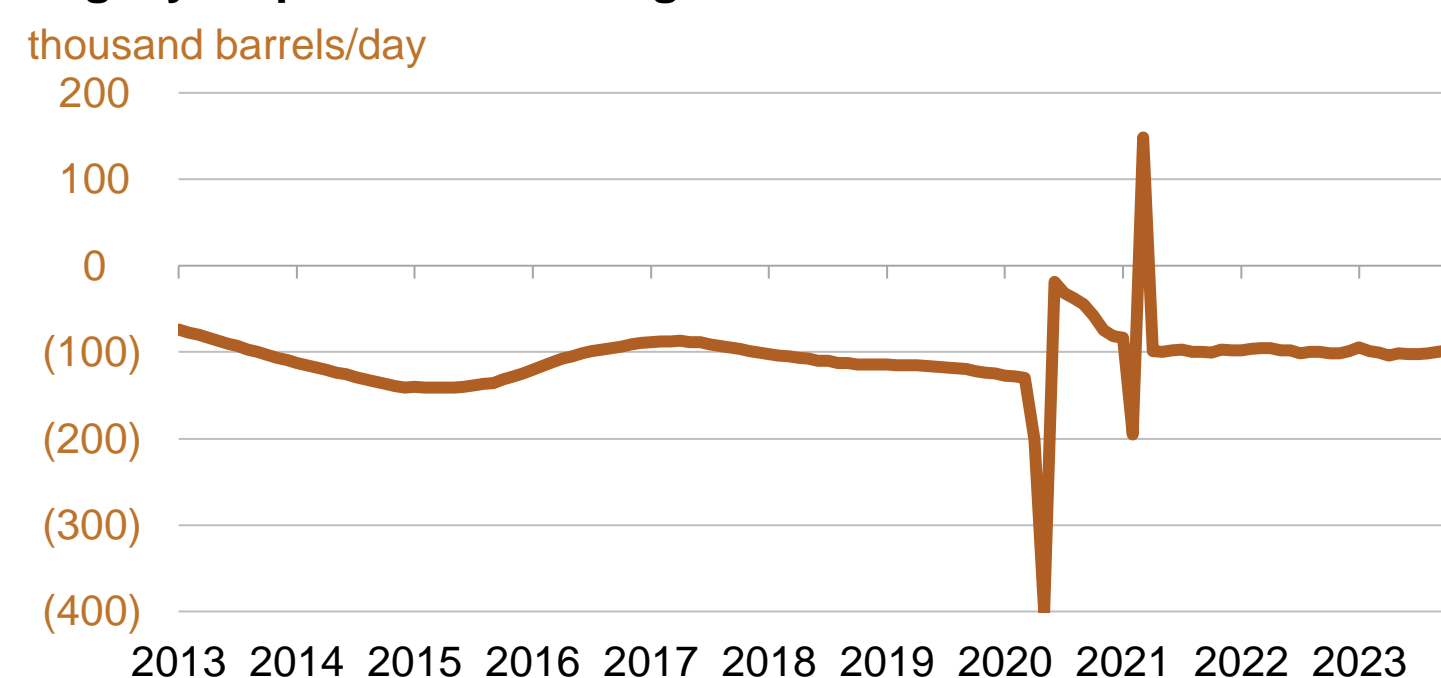
Eagle Ford Region
New-well oil production per rig



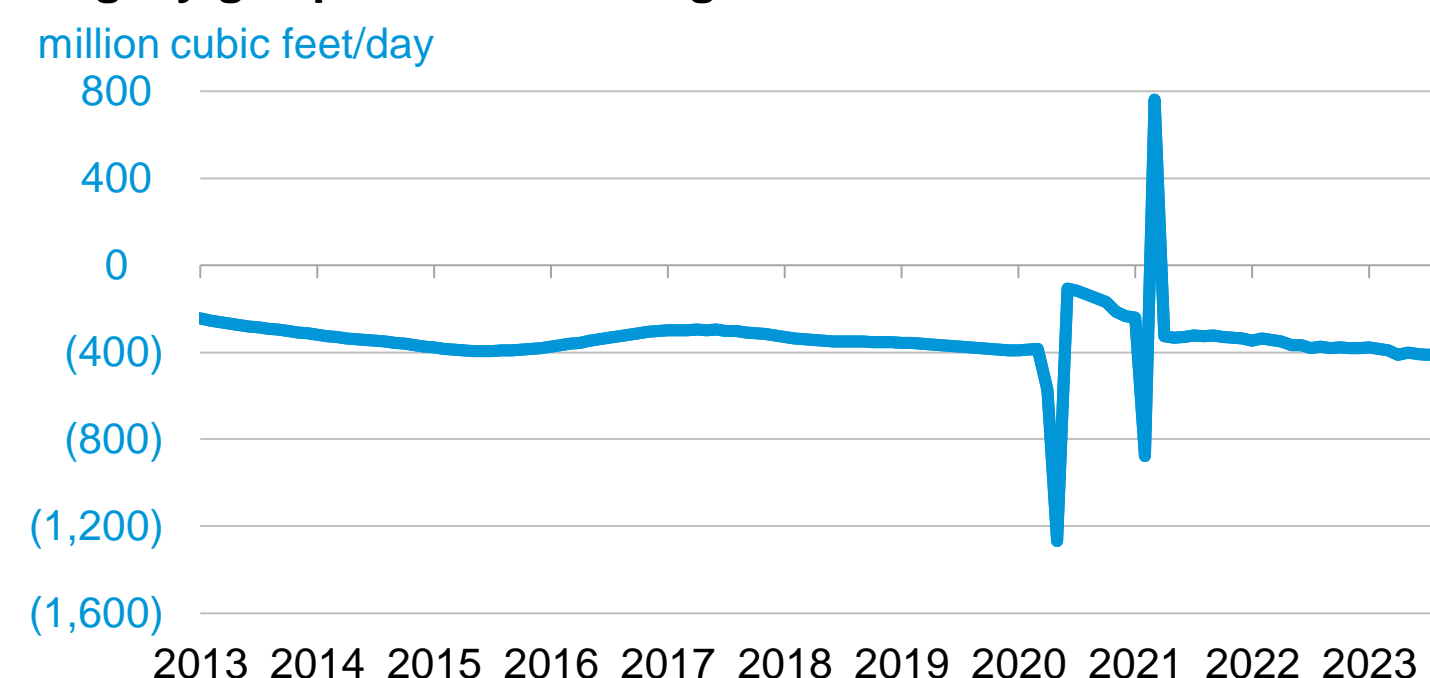
Eagle Ford Region
New-well gas production per rig



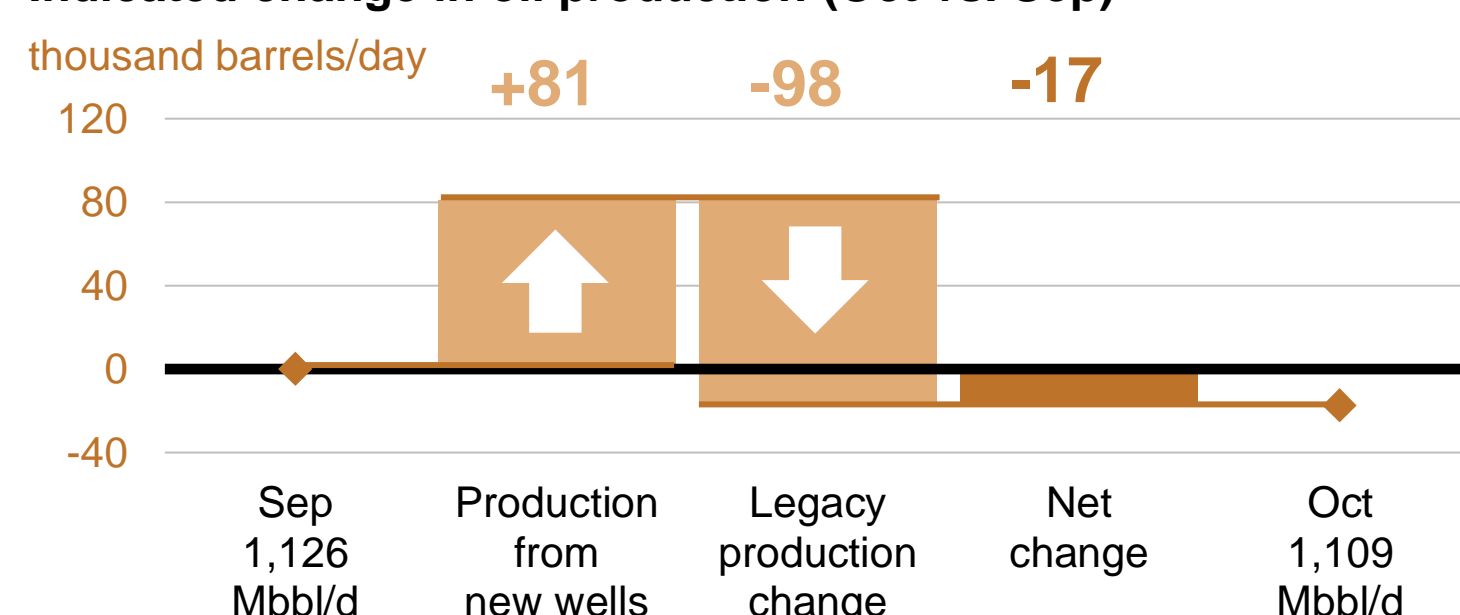
Eagle Ford Region
Legacy oil production change



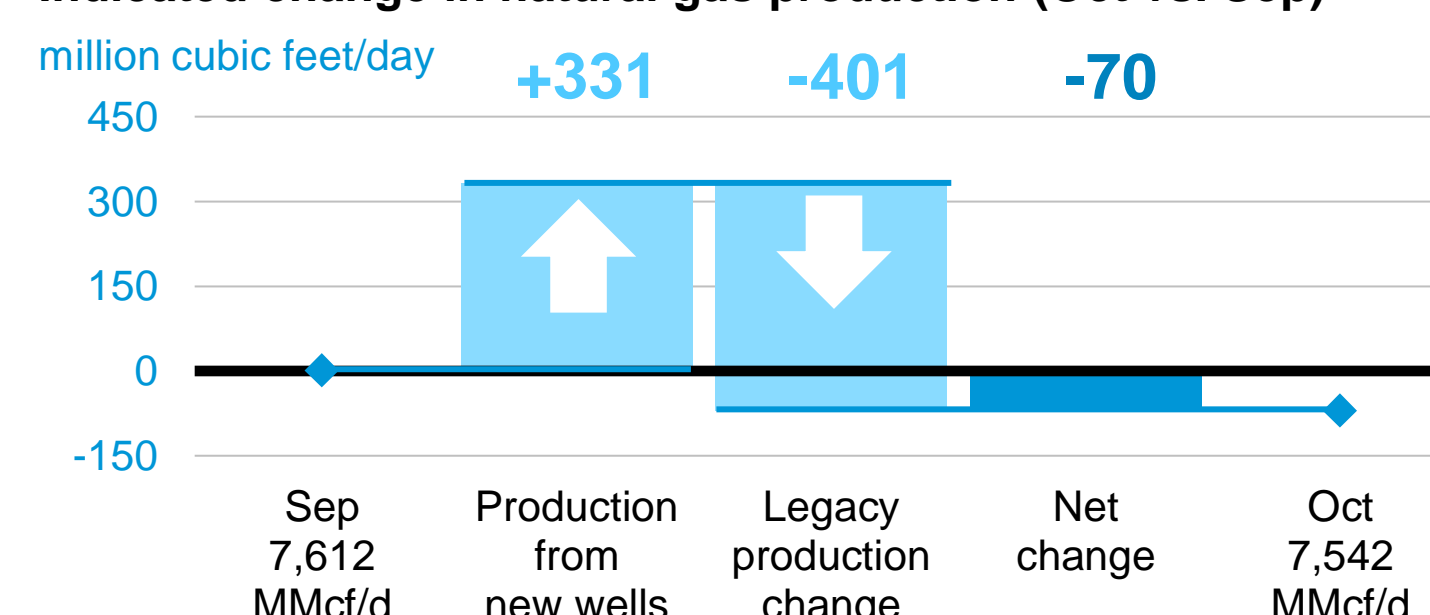
Eagle Ford Region
Legacy gas production change



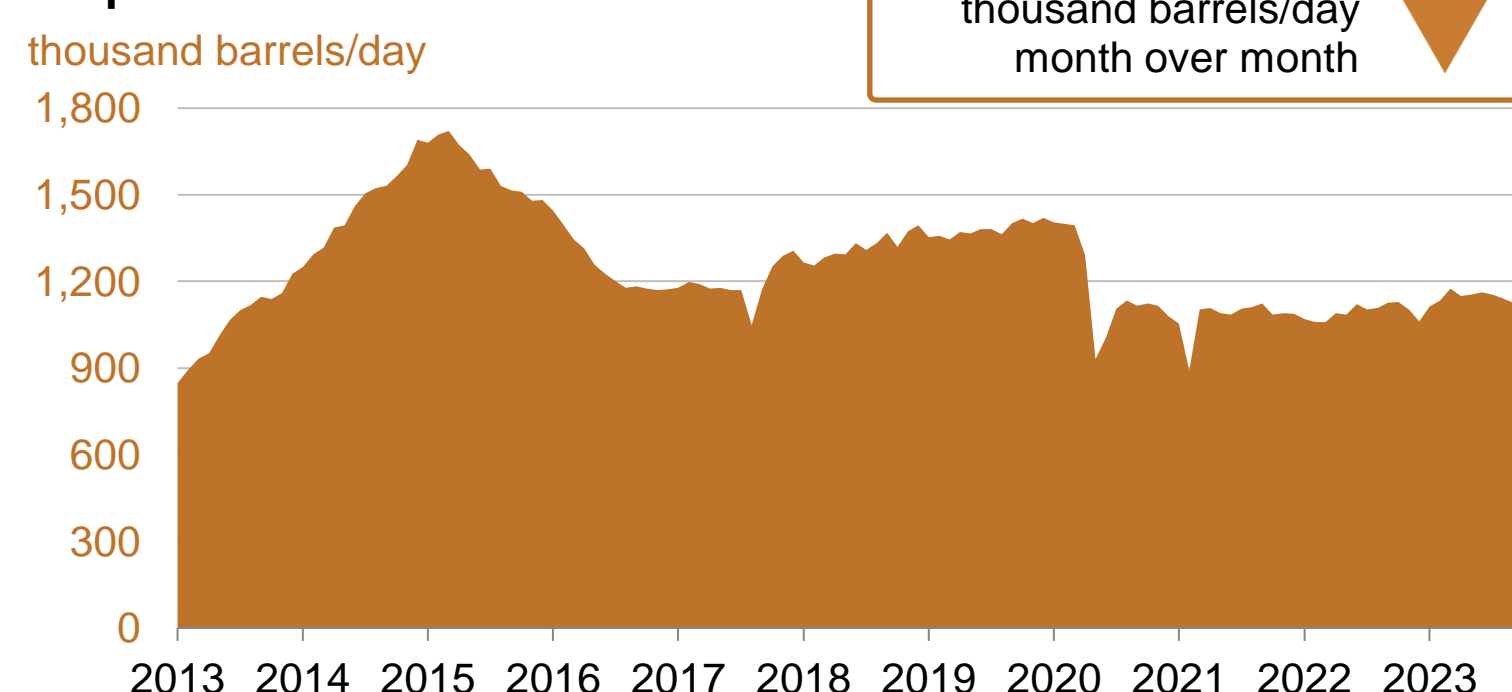
Eagle Ford Region
Indicated change in oil production (Oct vs. Sep)



Eagle Ford Region
Indicated change in natural gas production (Oct vs. Sep)

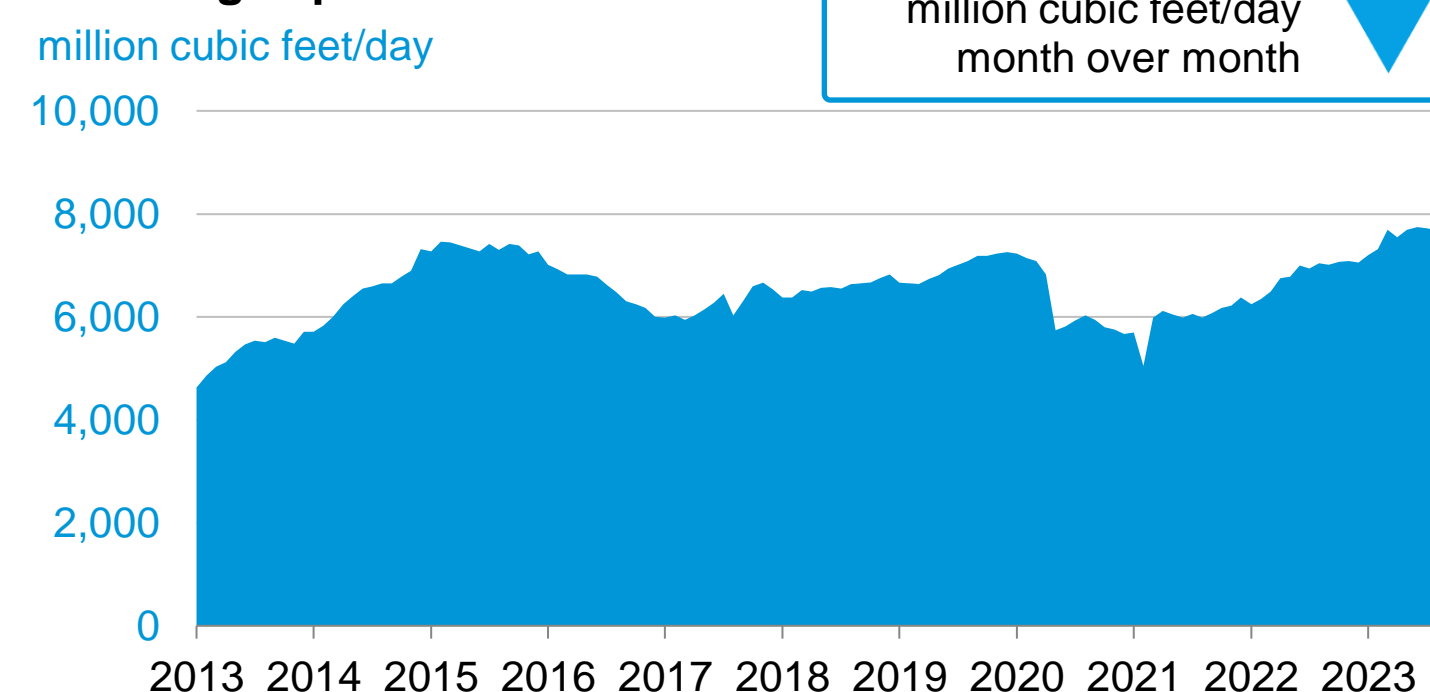


Eagle Ford Region
Oil production



Oil -17
thousand barrels/day
month over month

Eagle Ford Region
Natural gas production



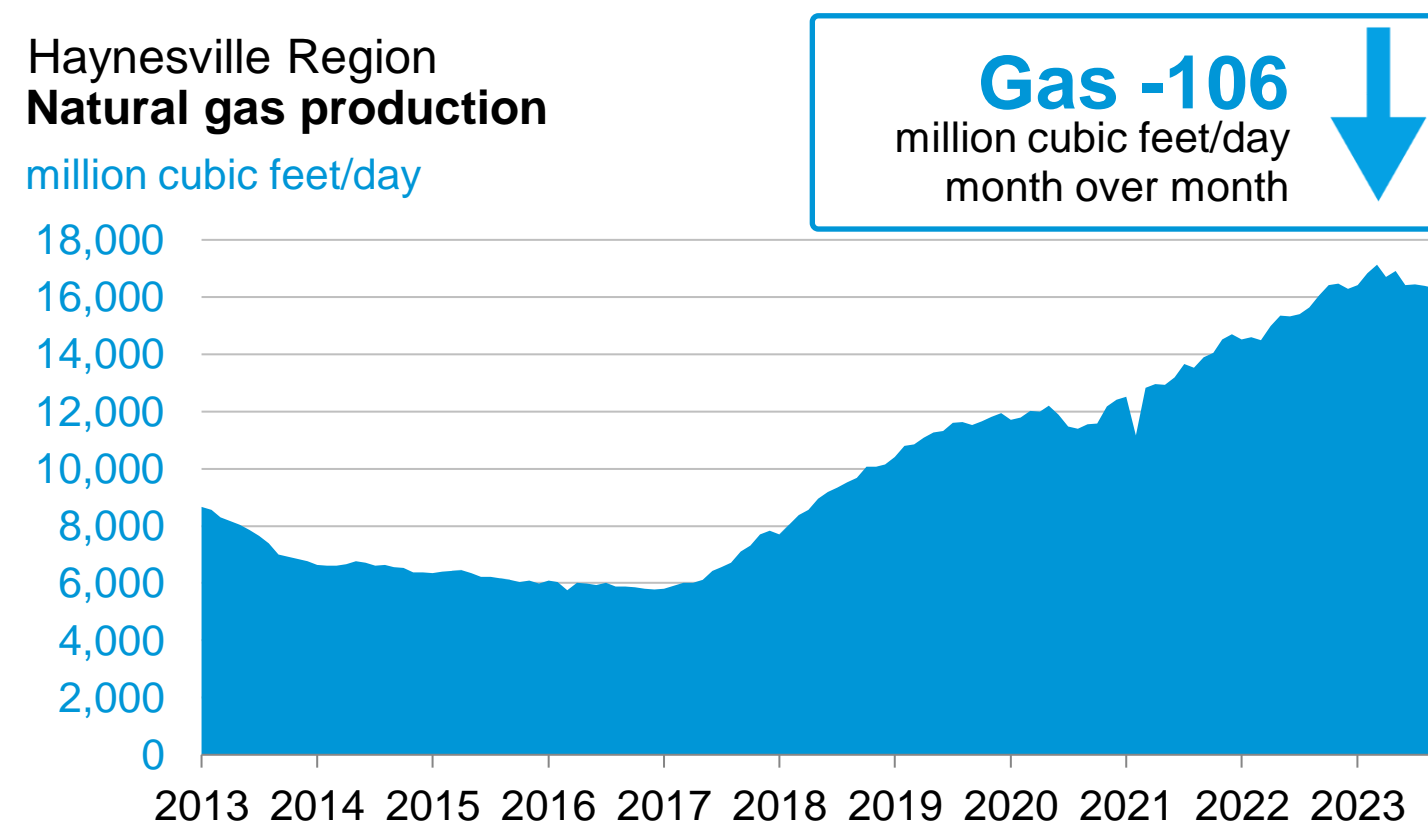
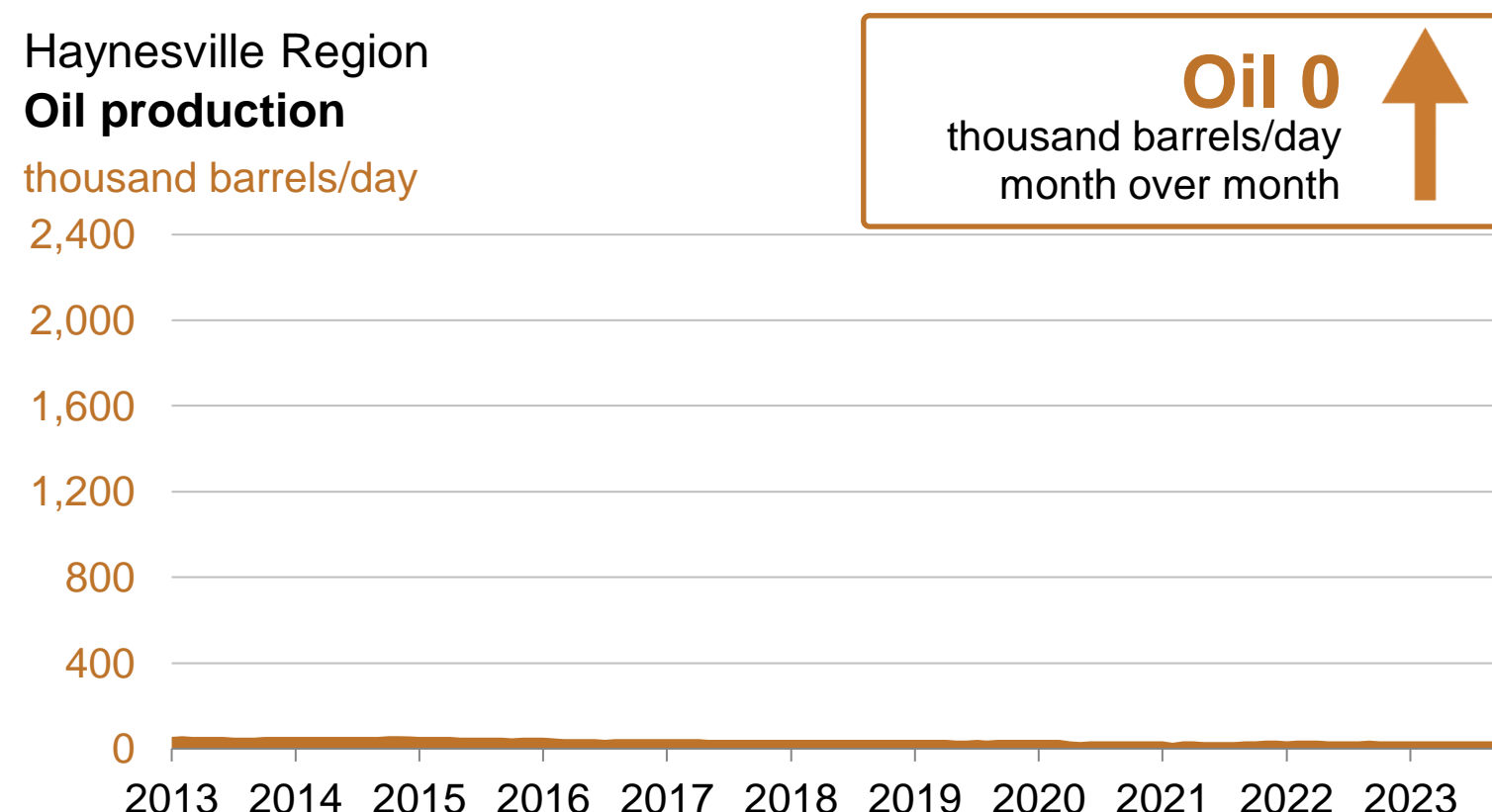
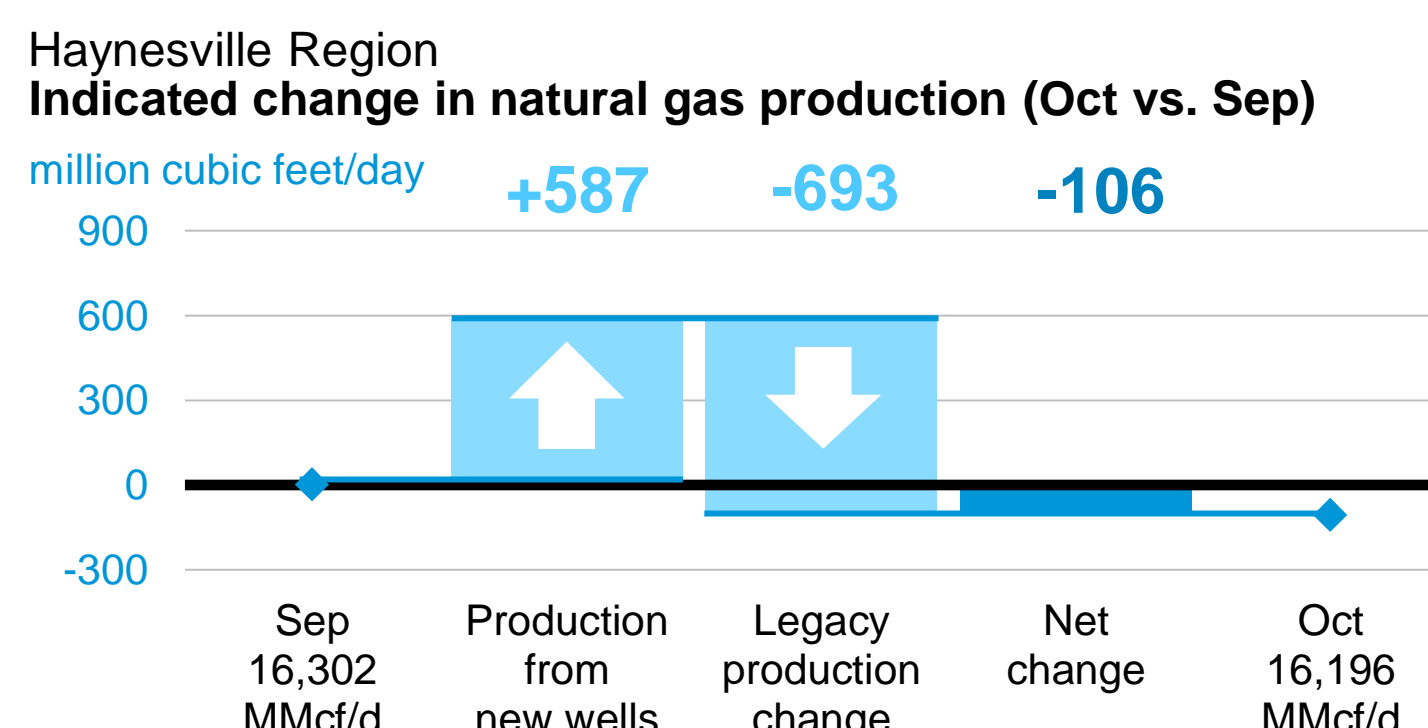
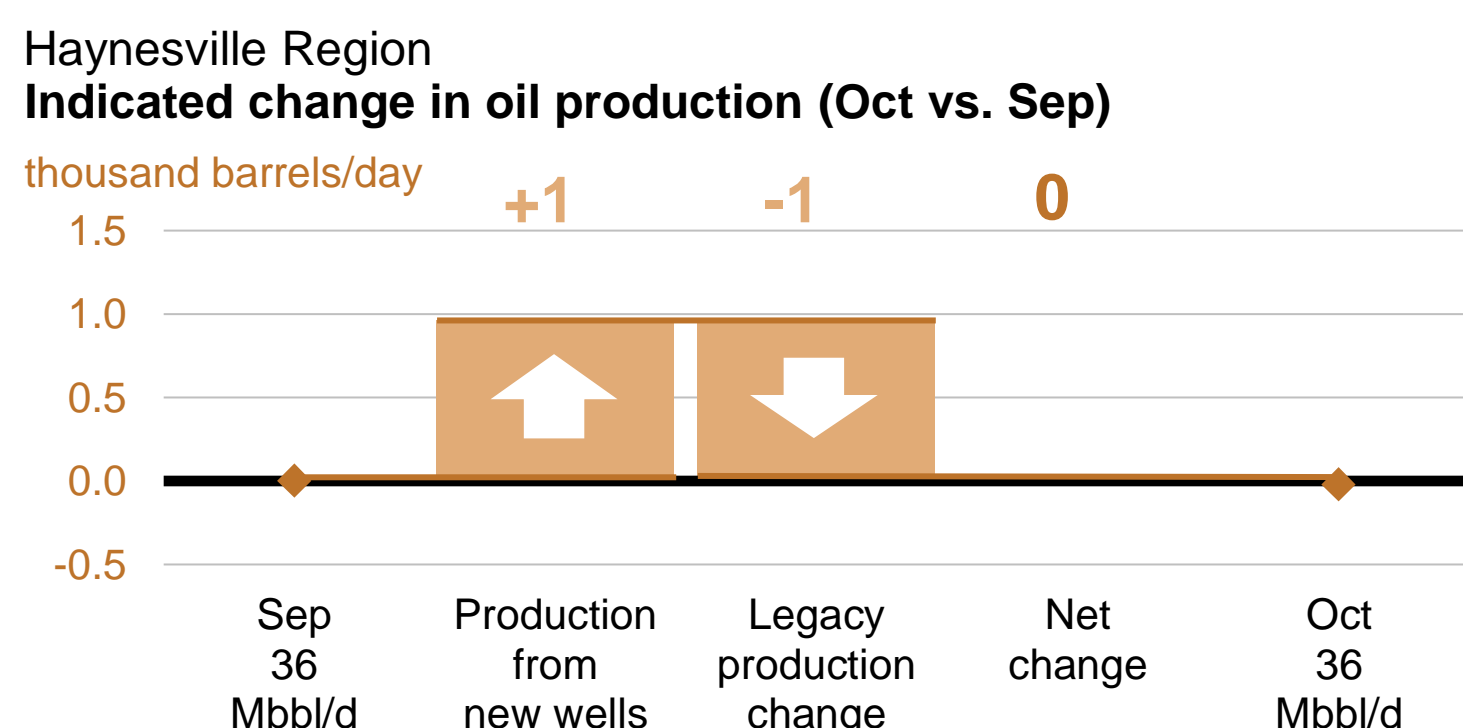
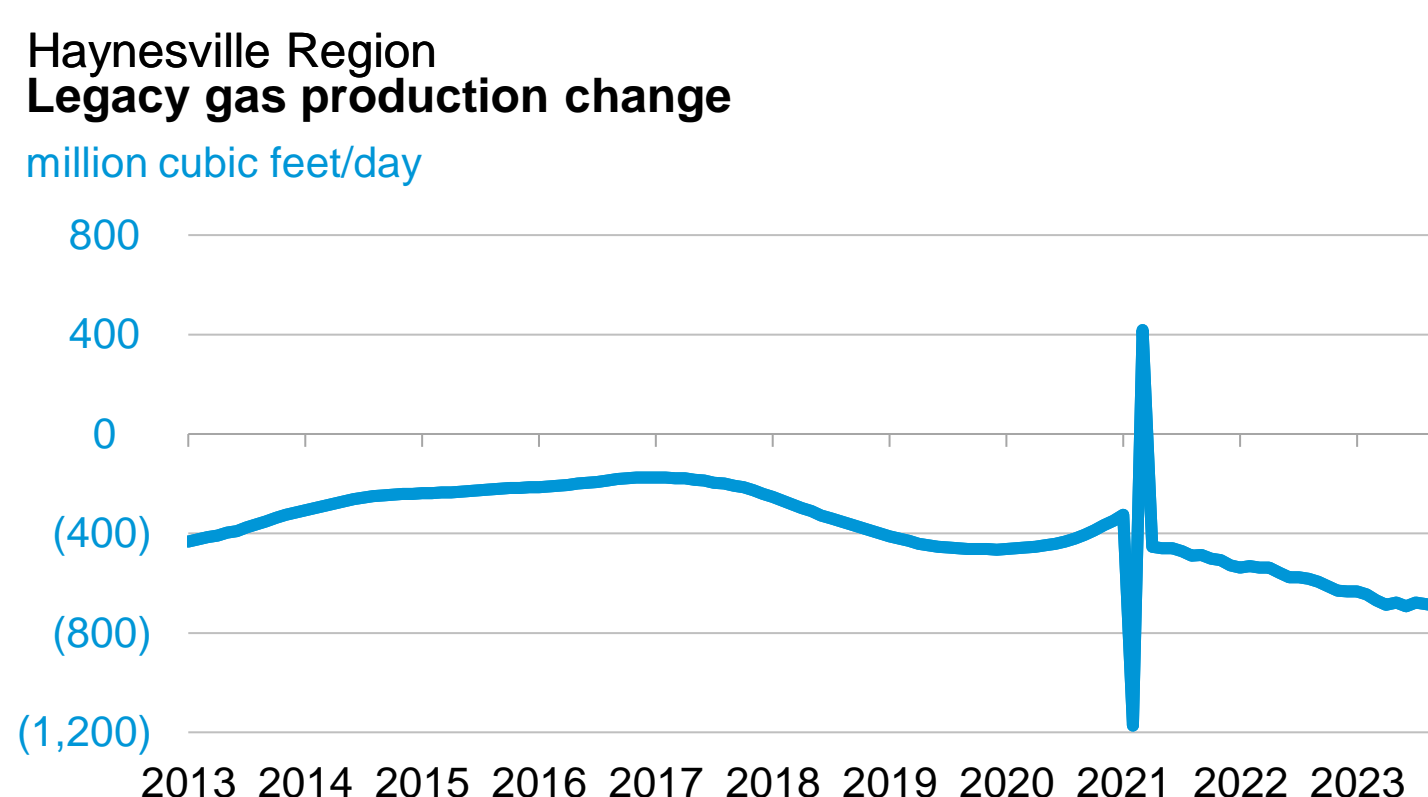
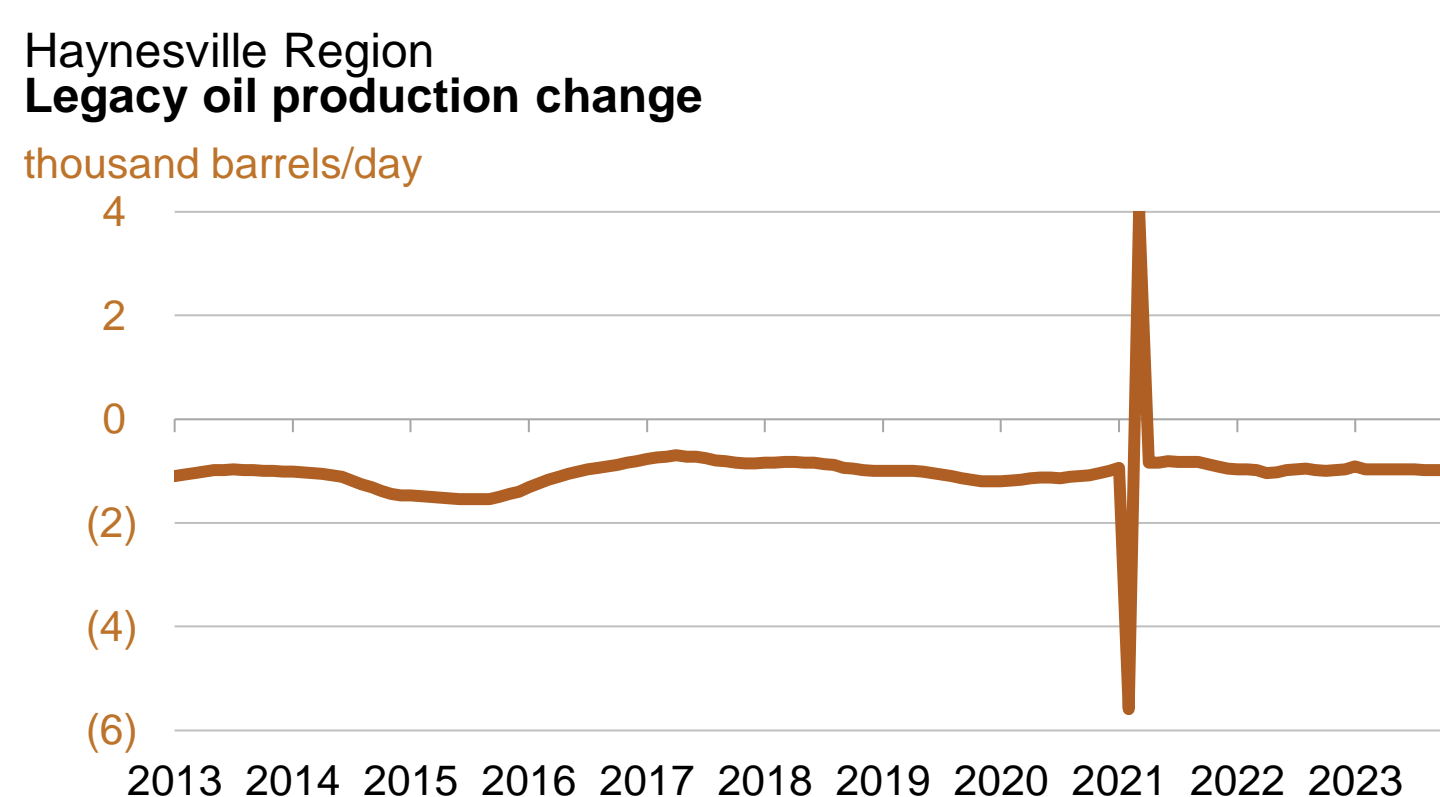
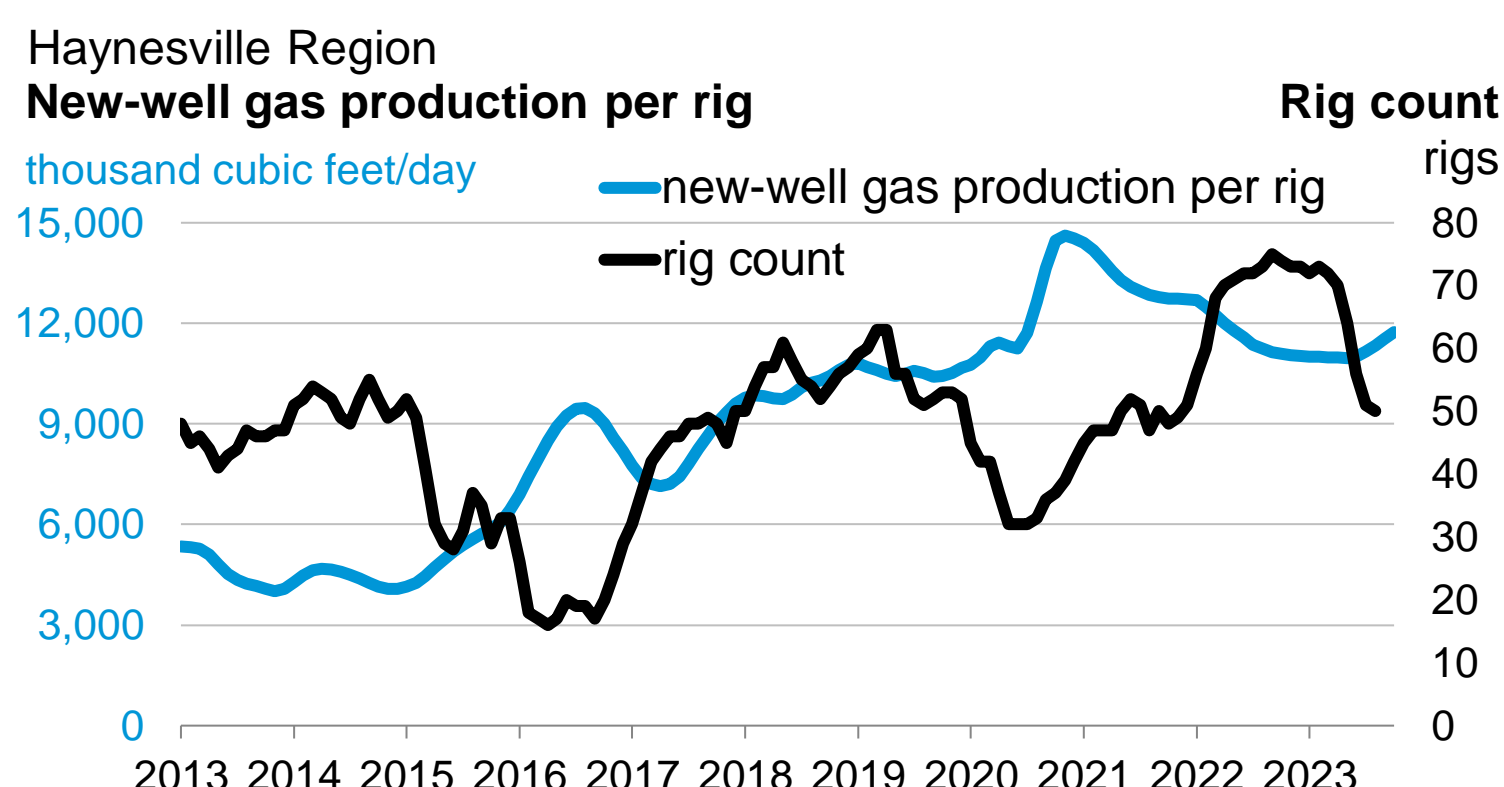
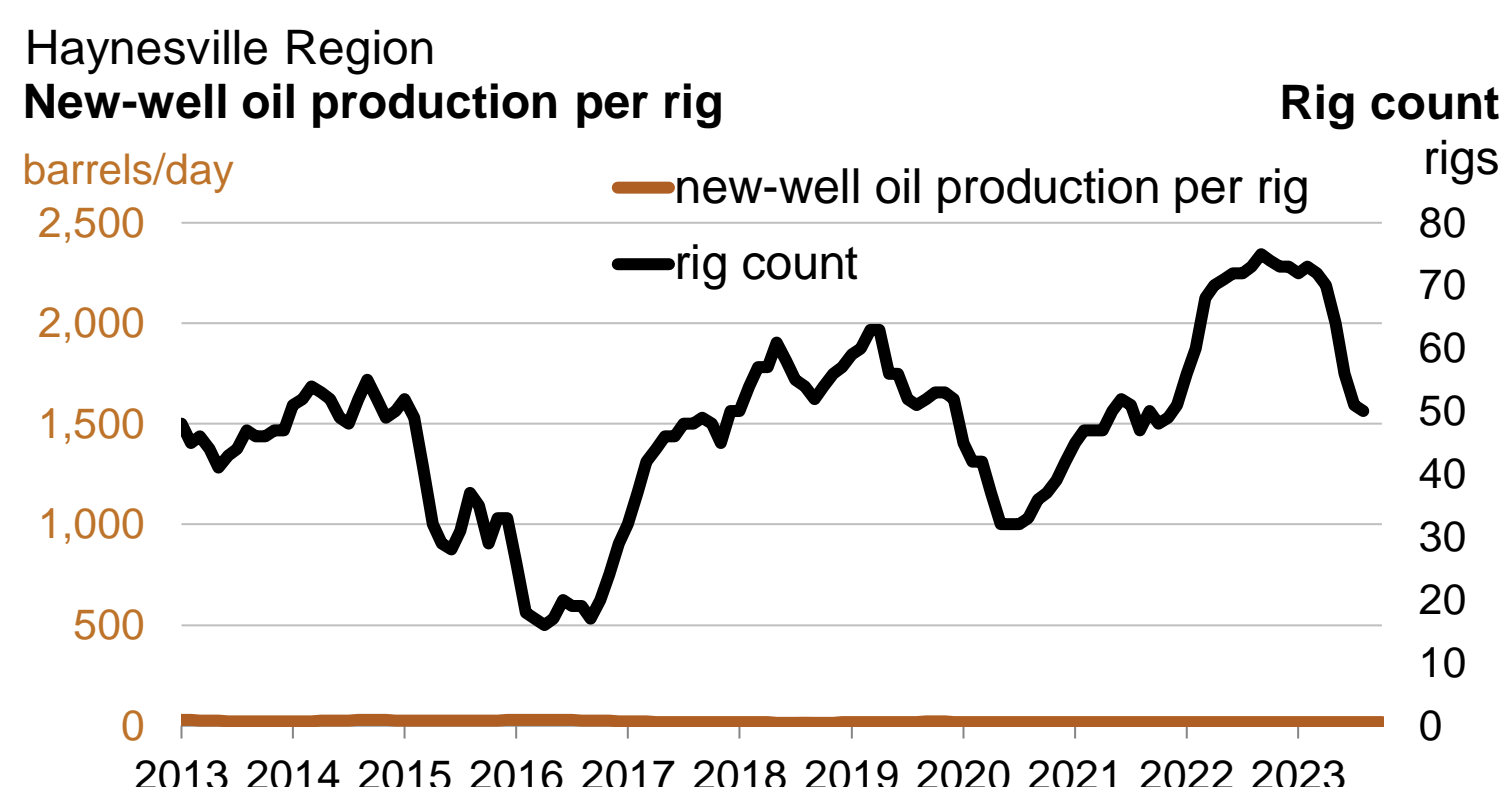
Gas -70
million cubic feet/day
month over month

eia Haynesville Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October

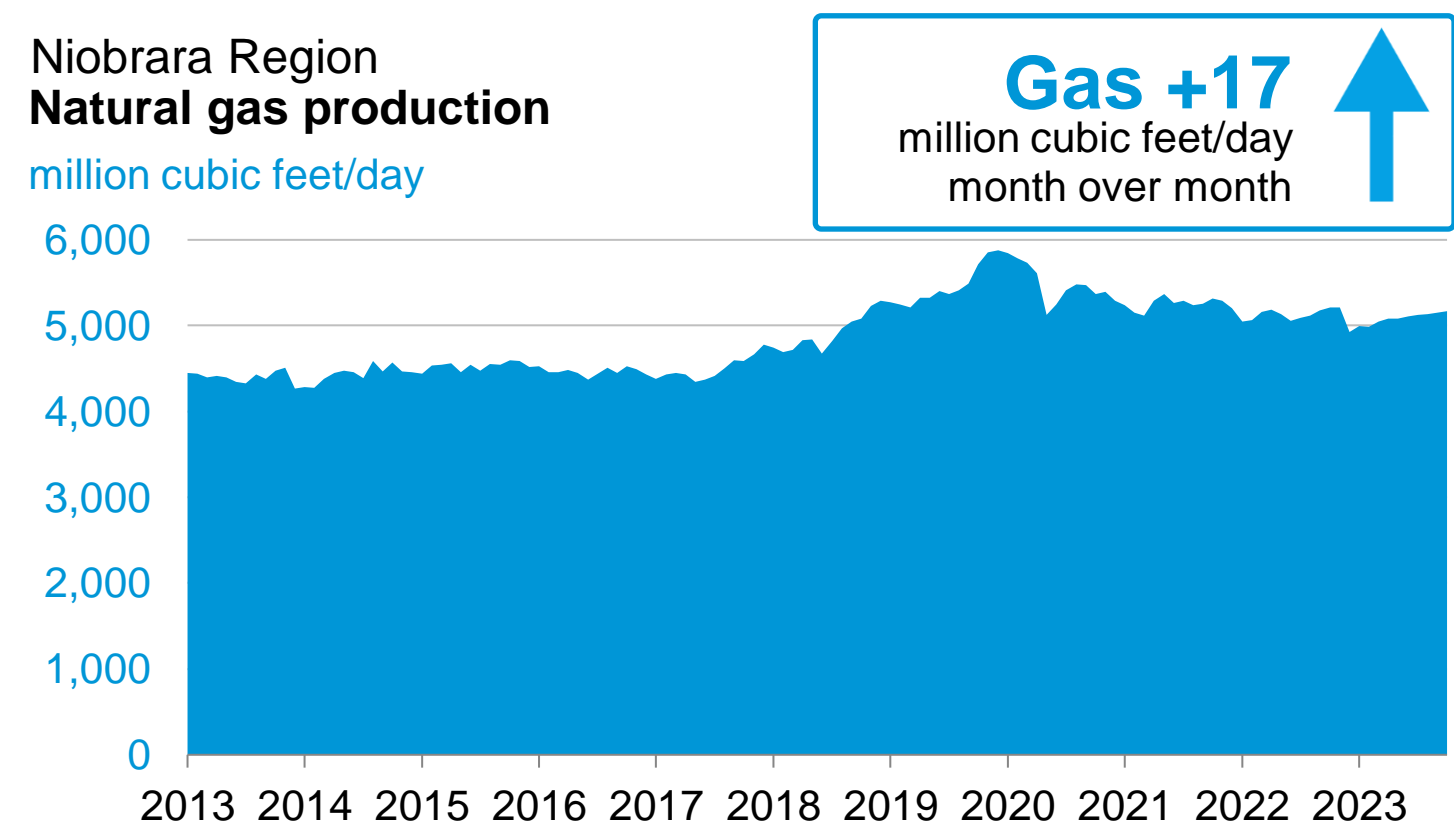
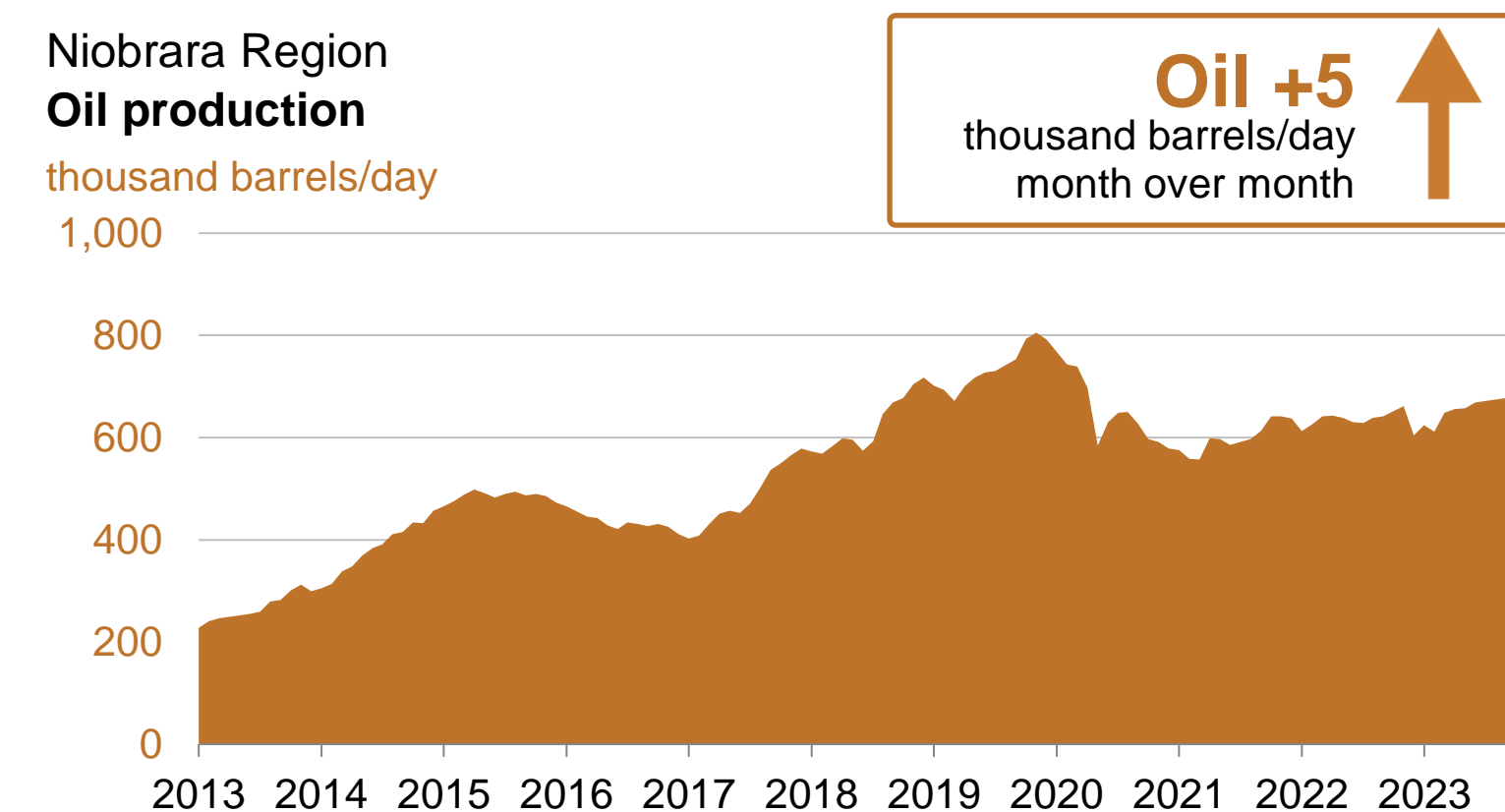
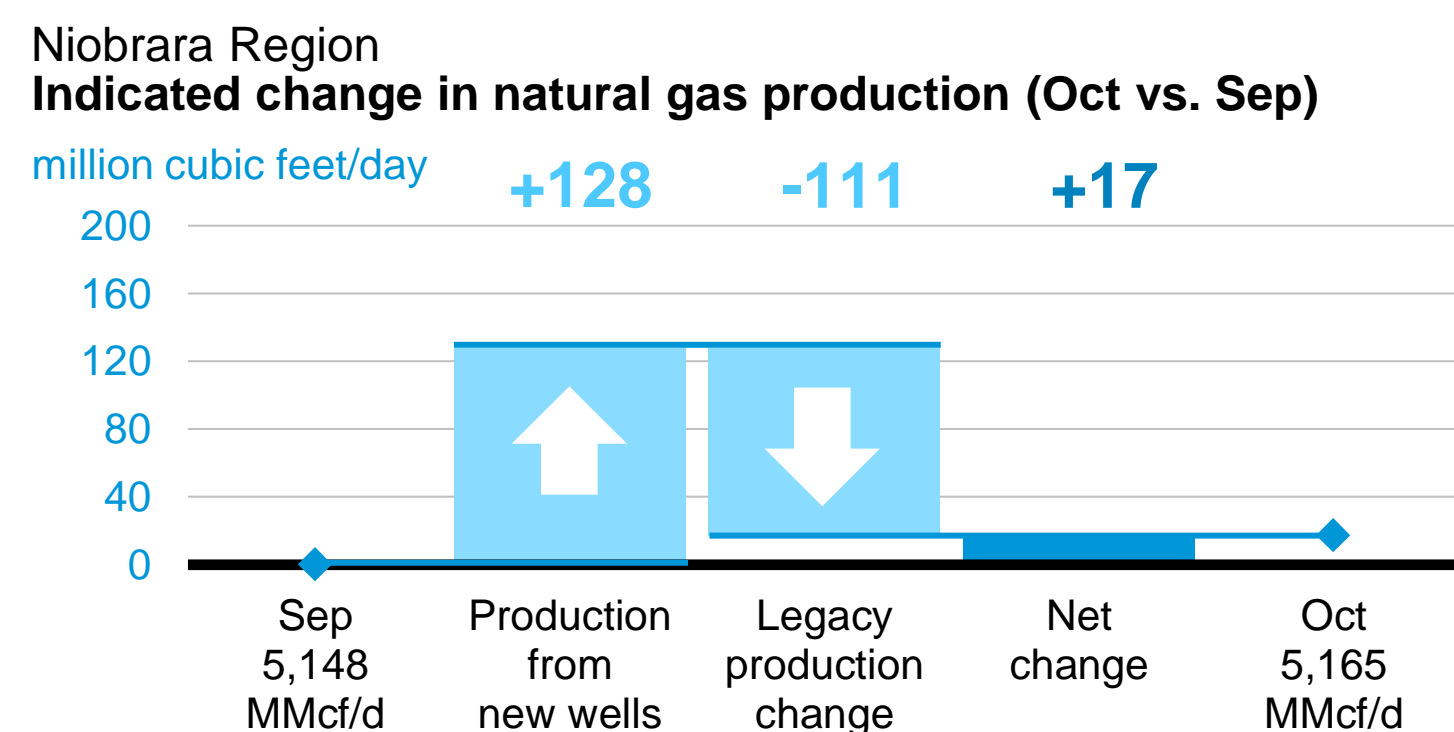
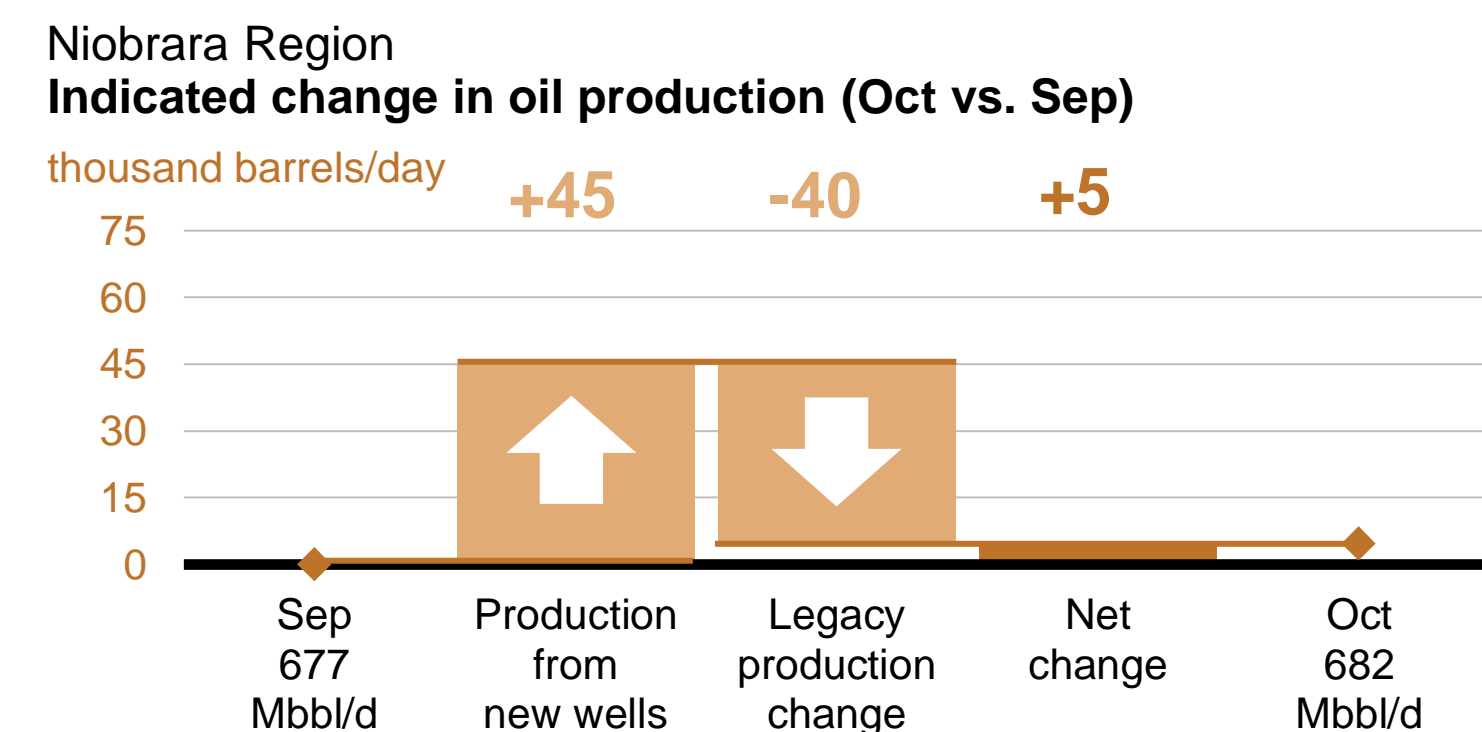
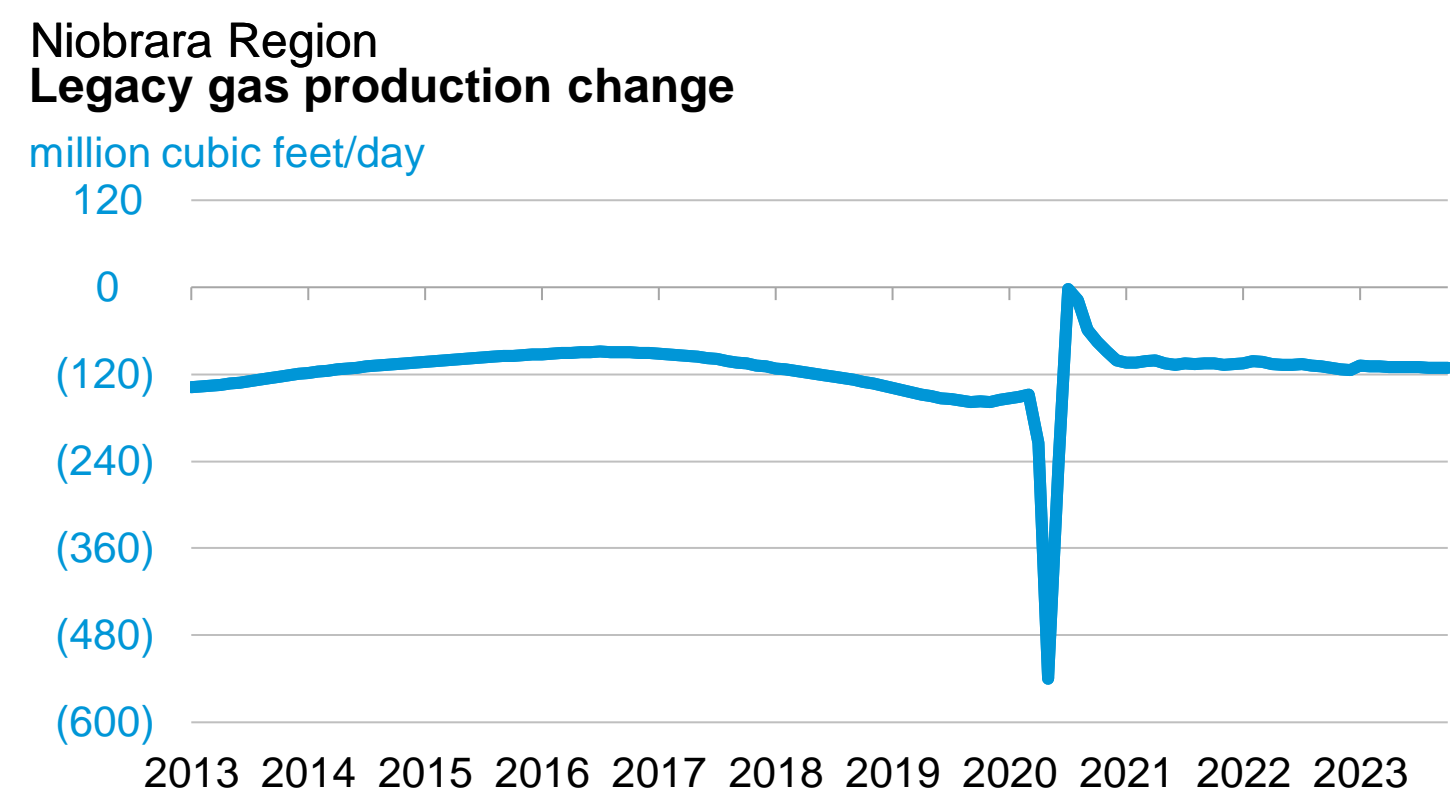
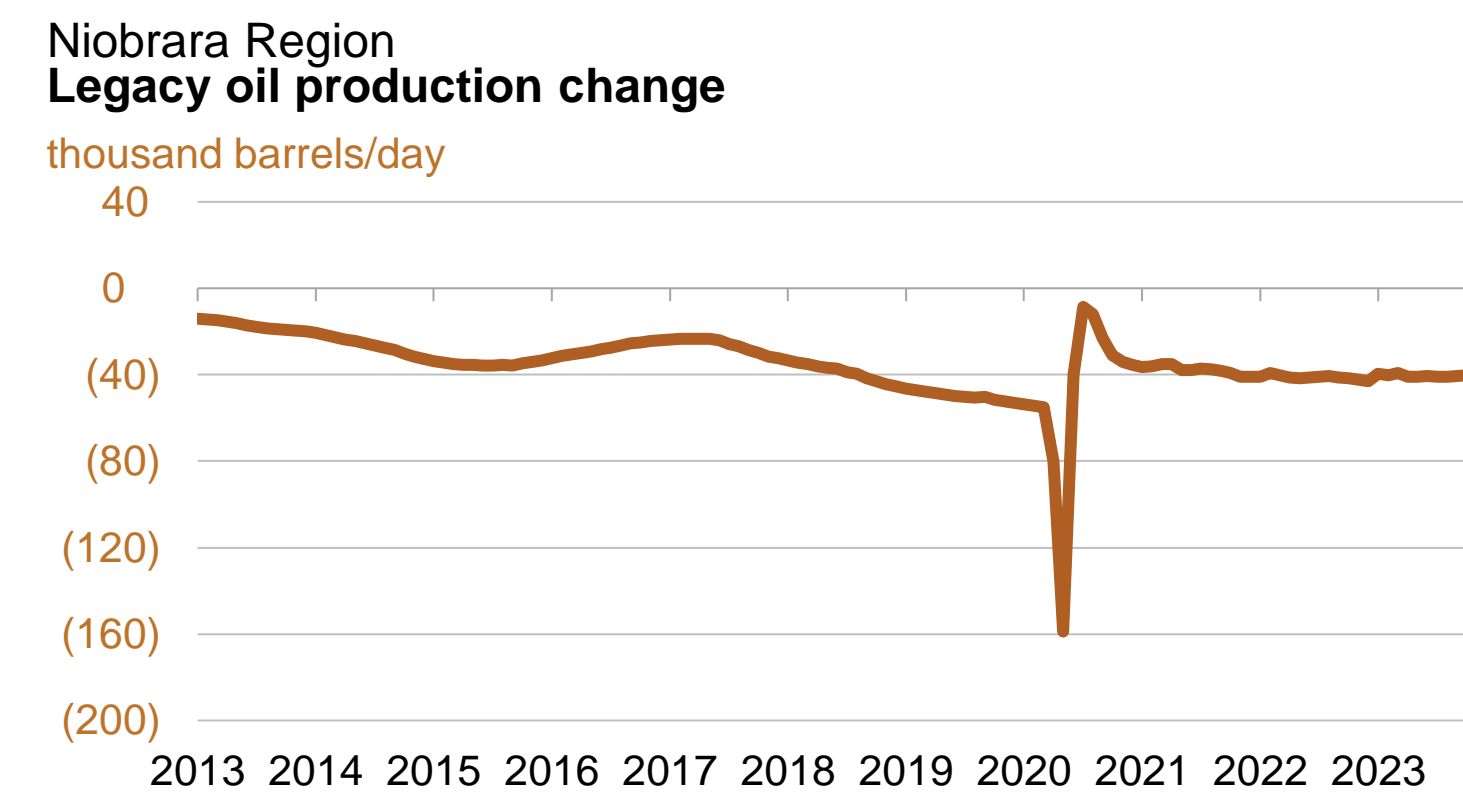
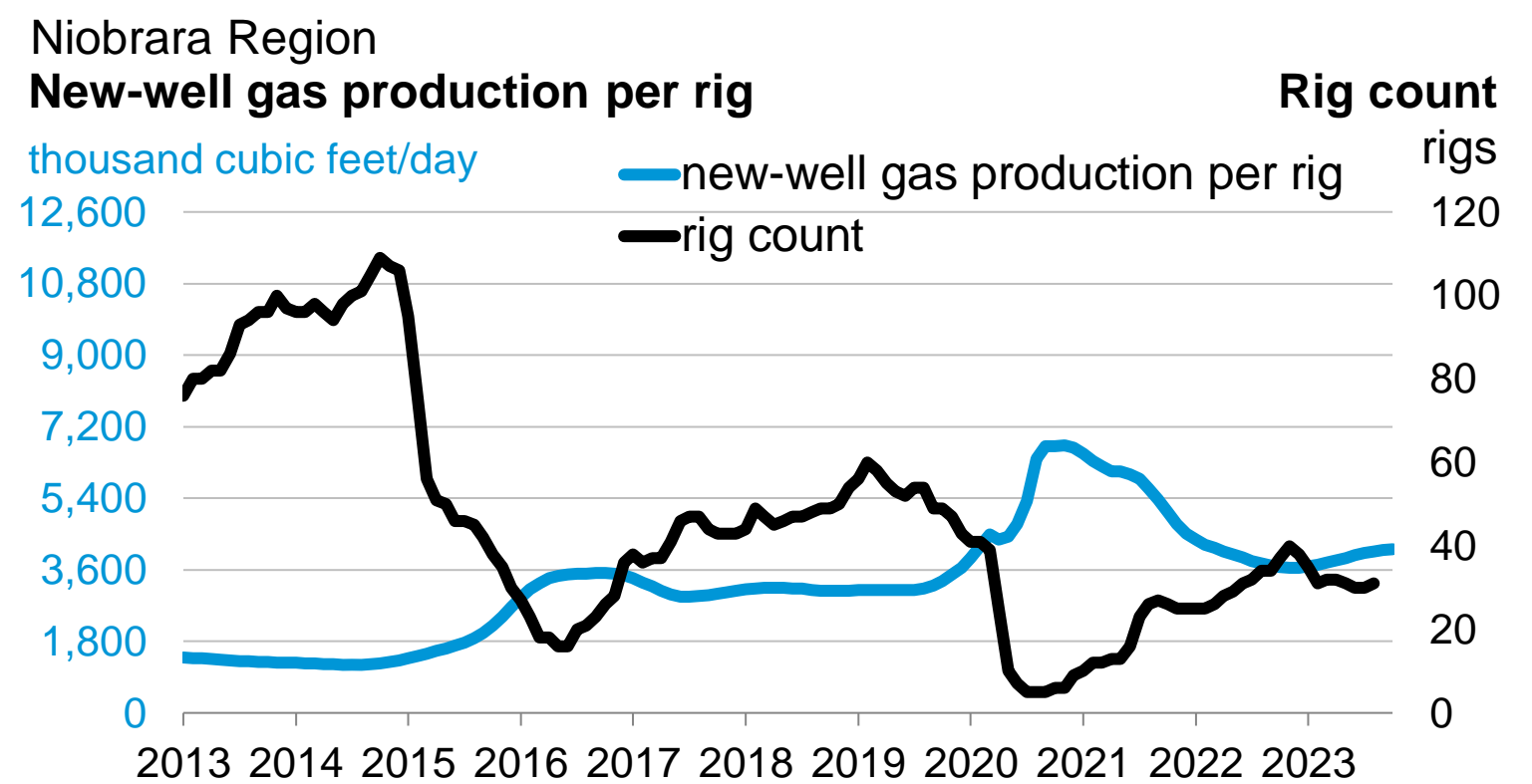
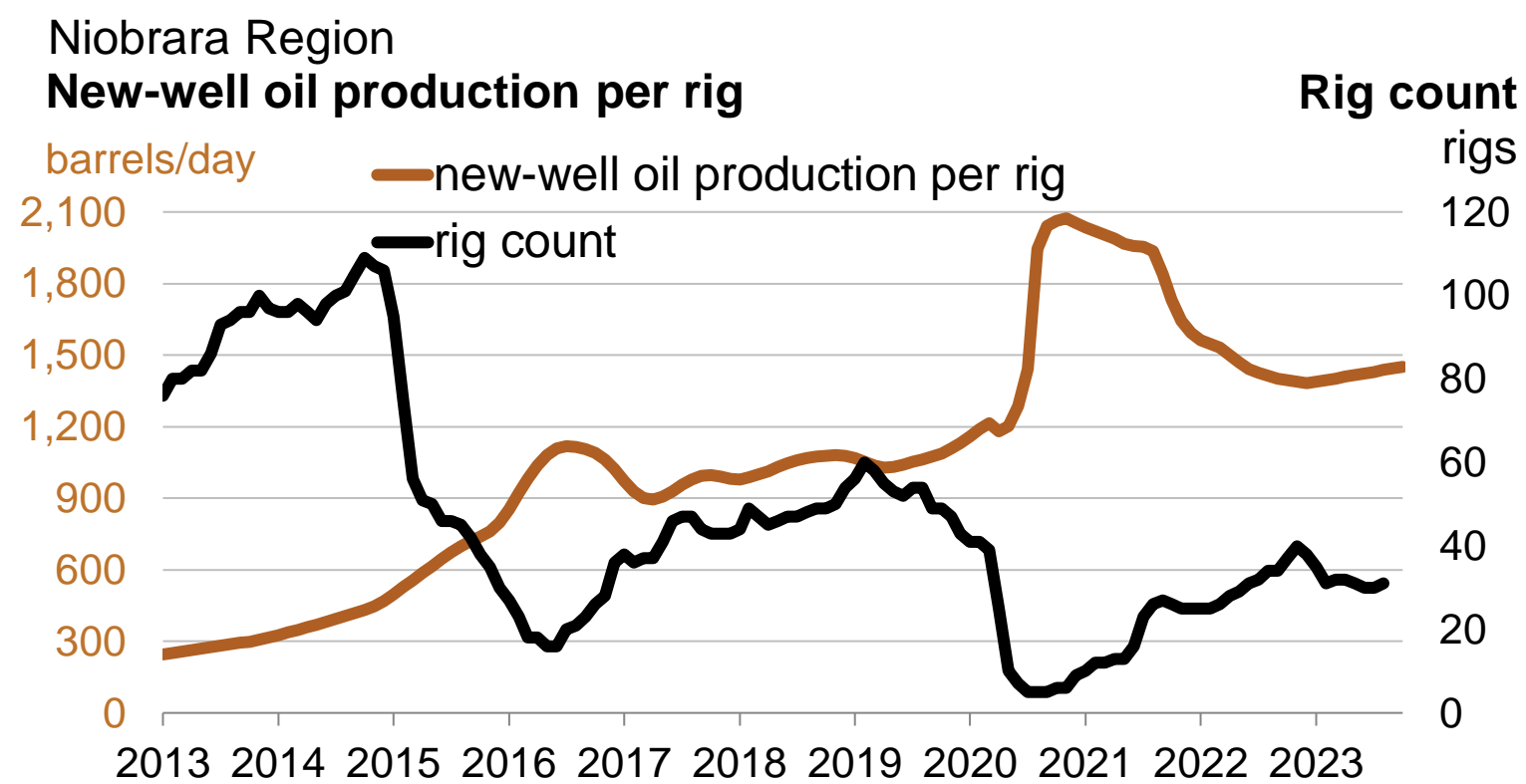
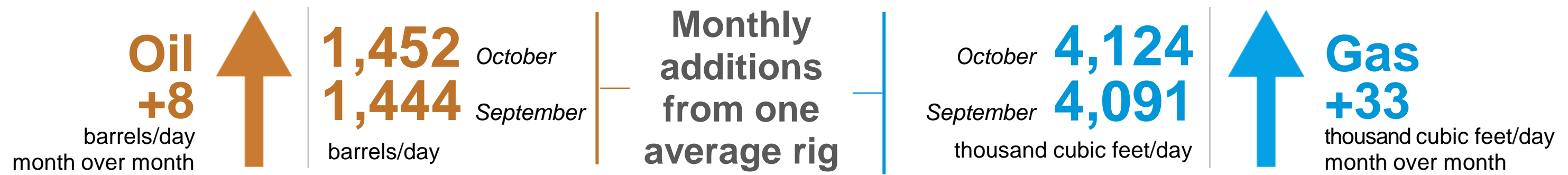


eia Niobrara Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October

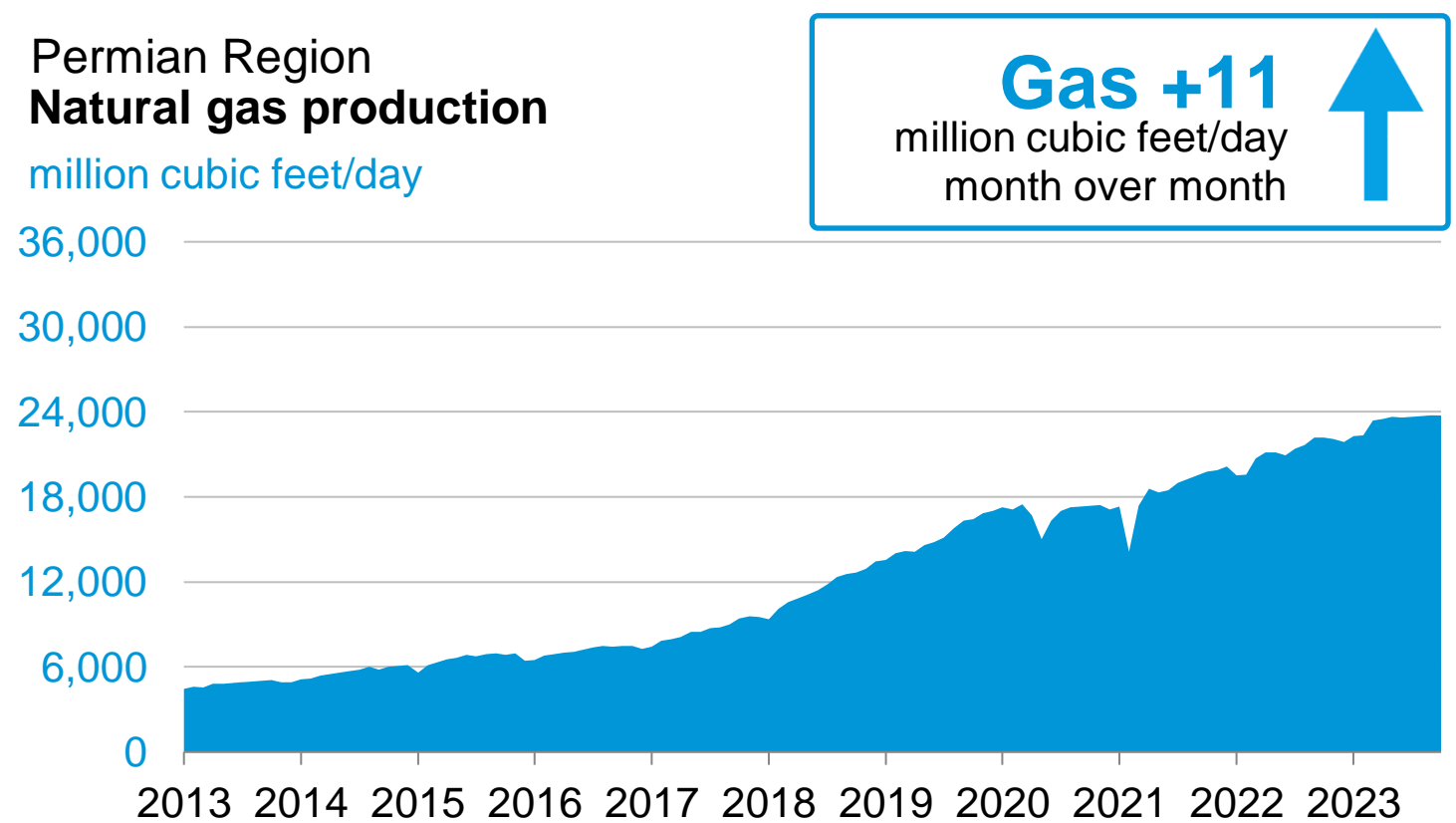
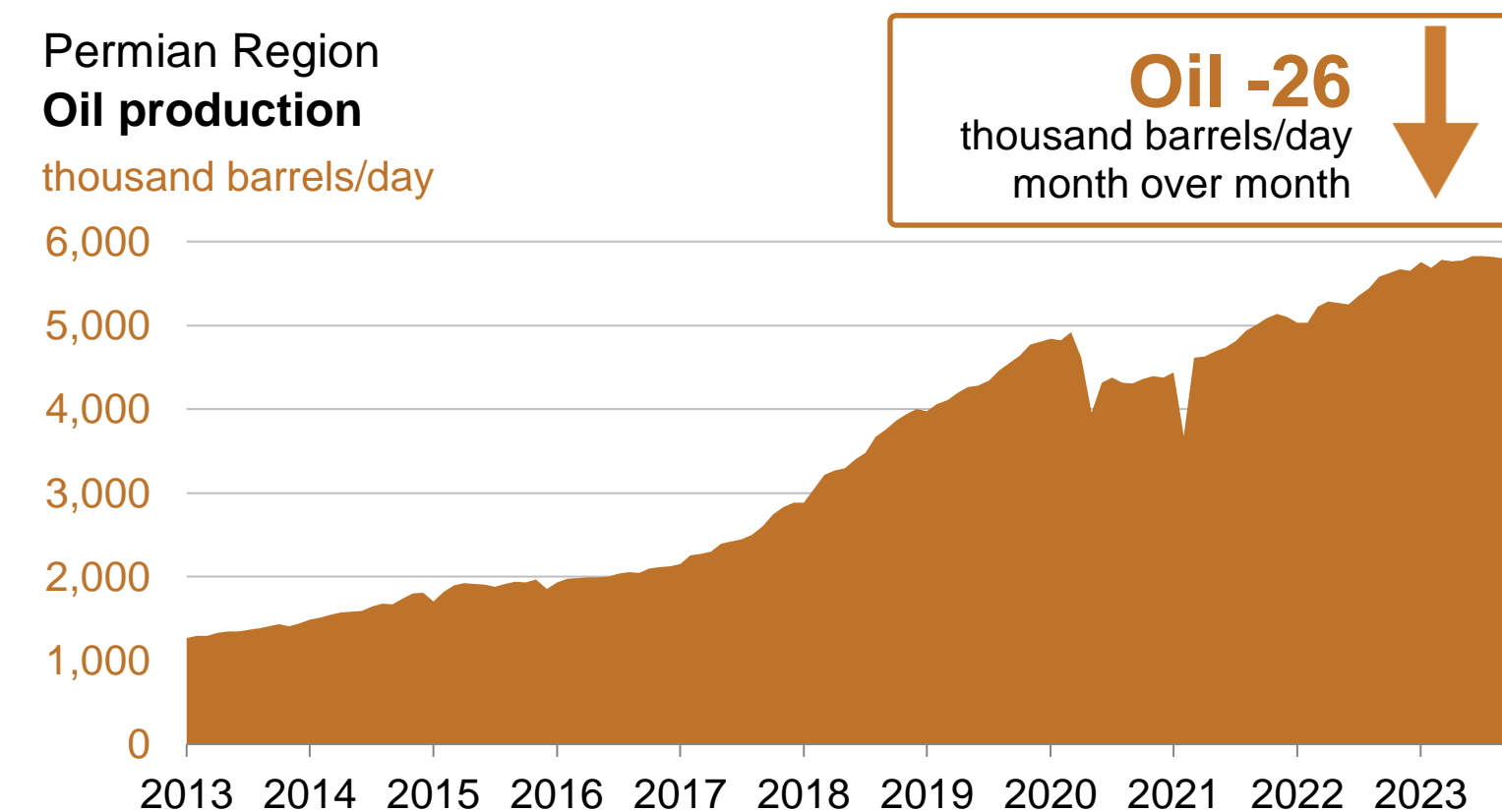
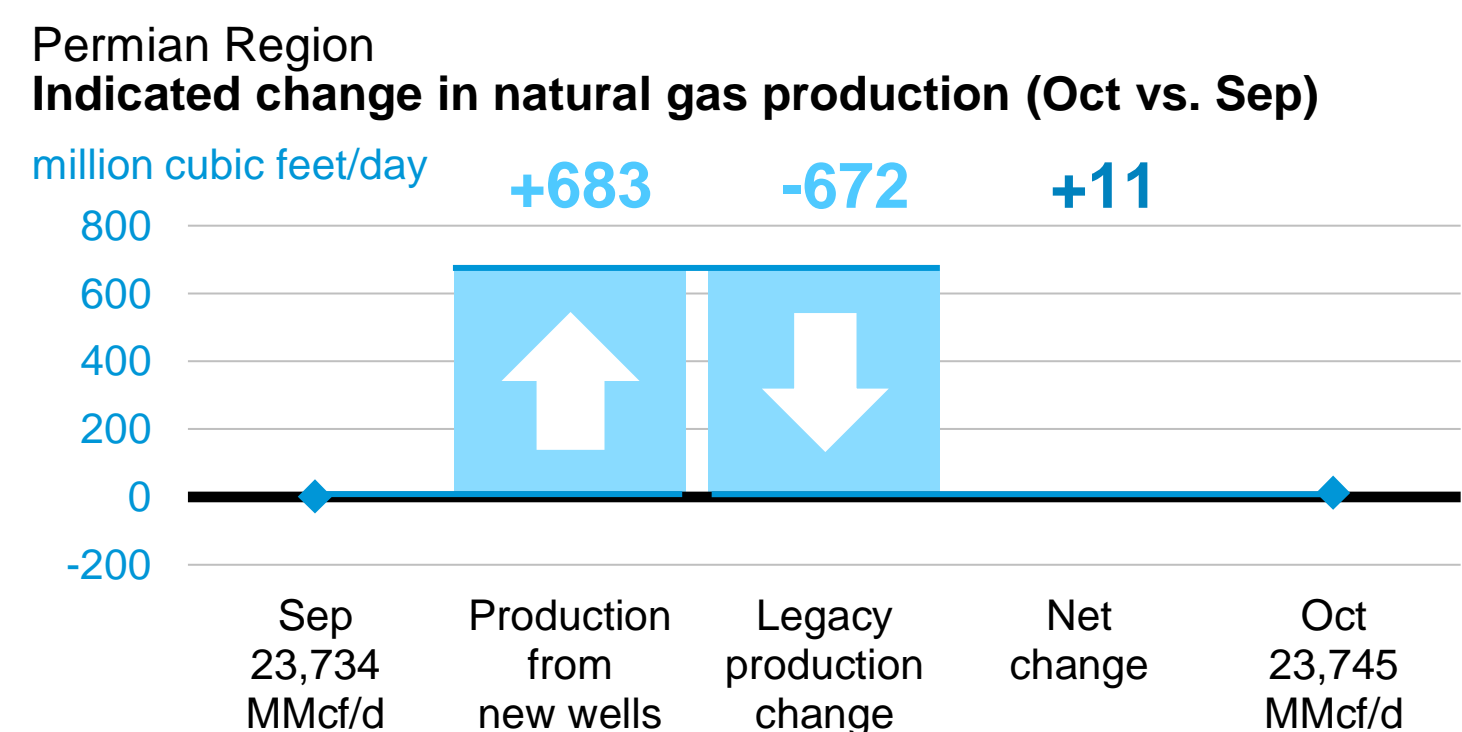
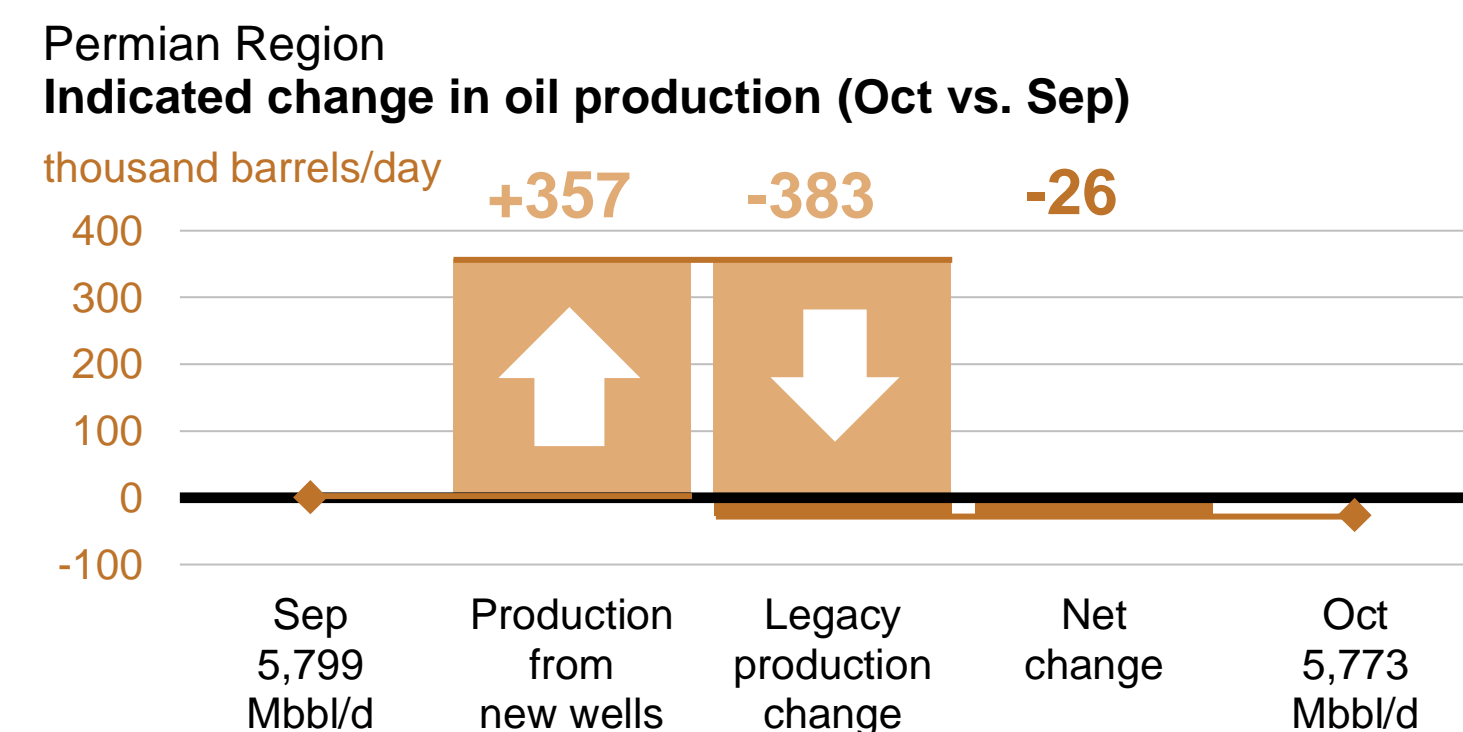
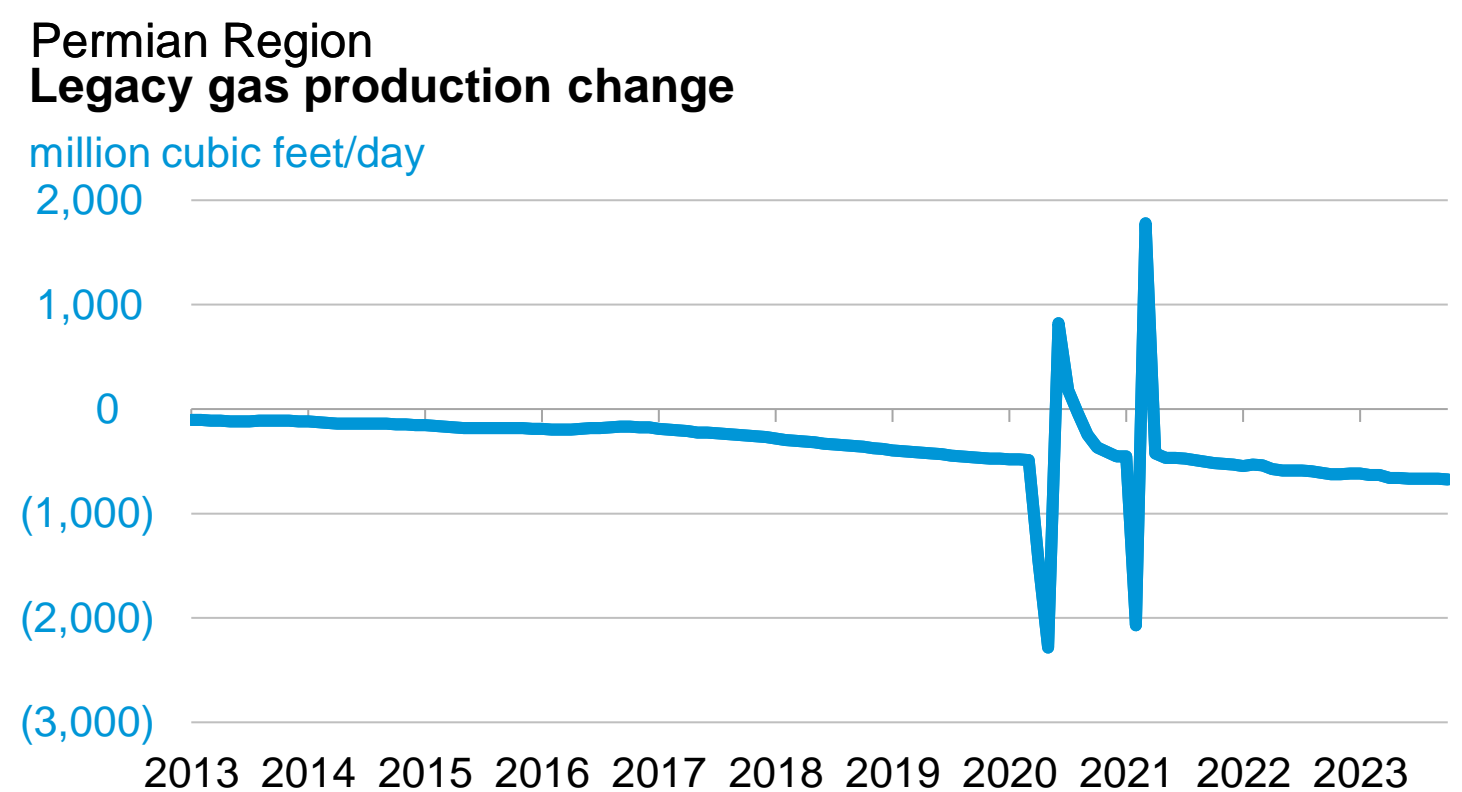
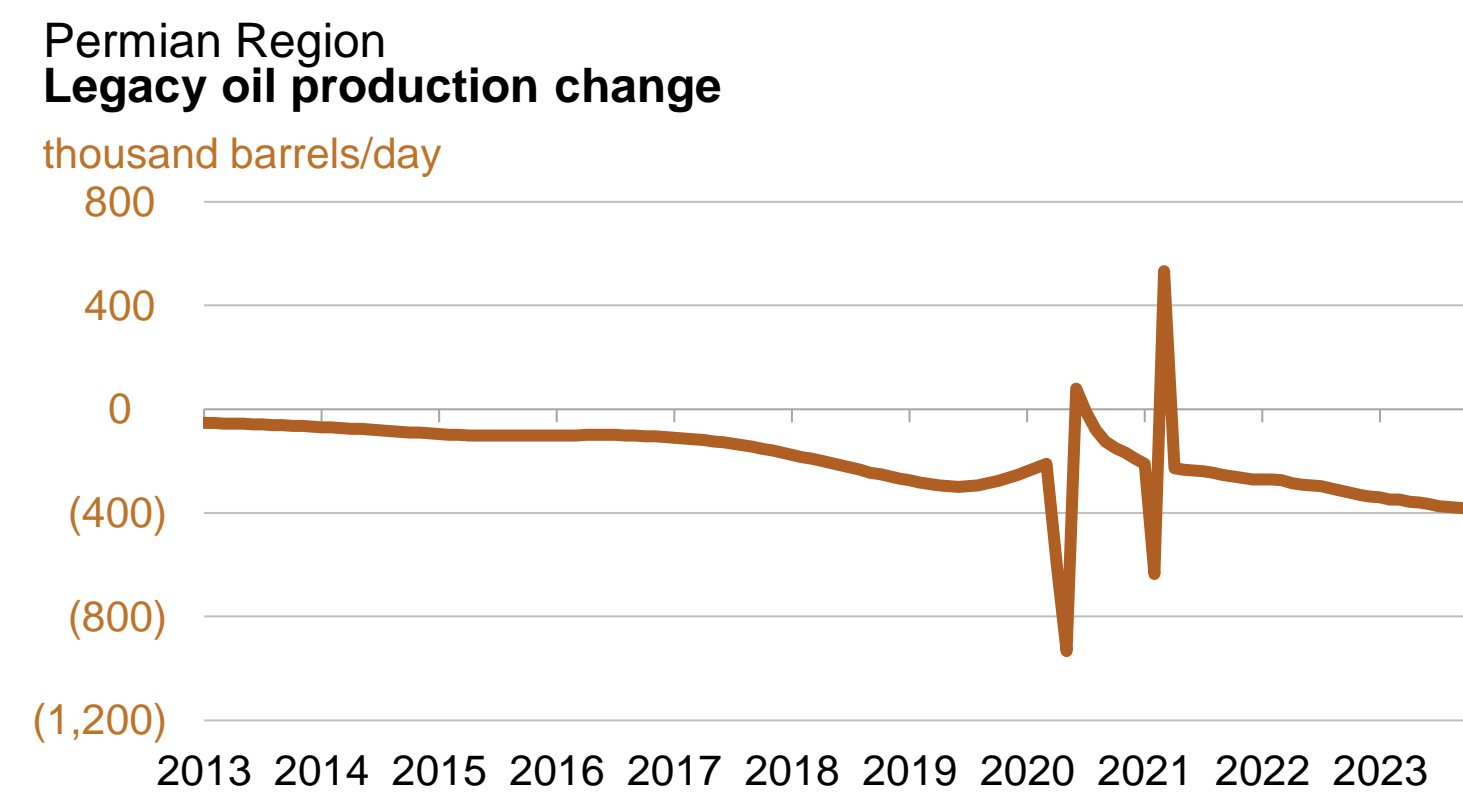
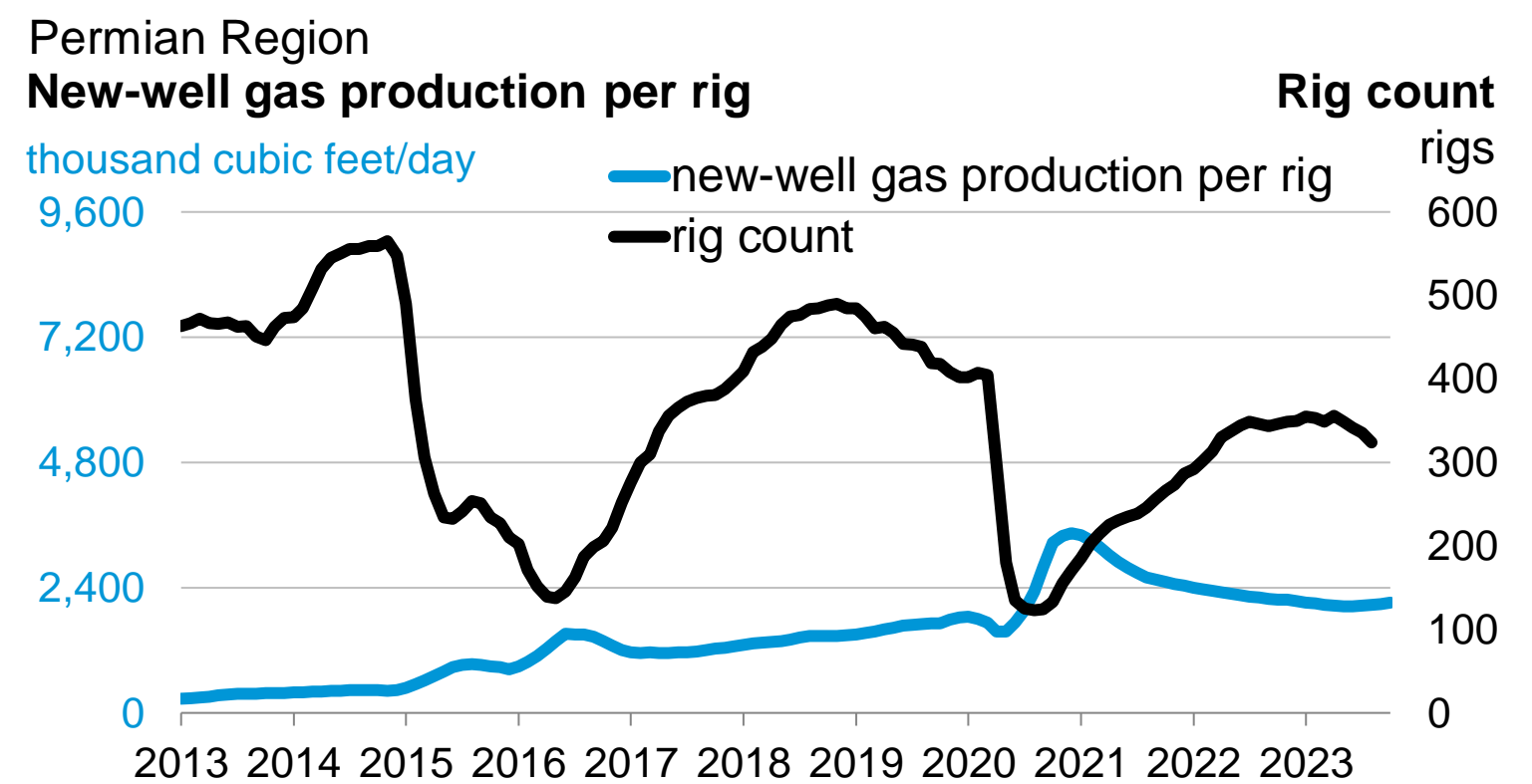
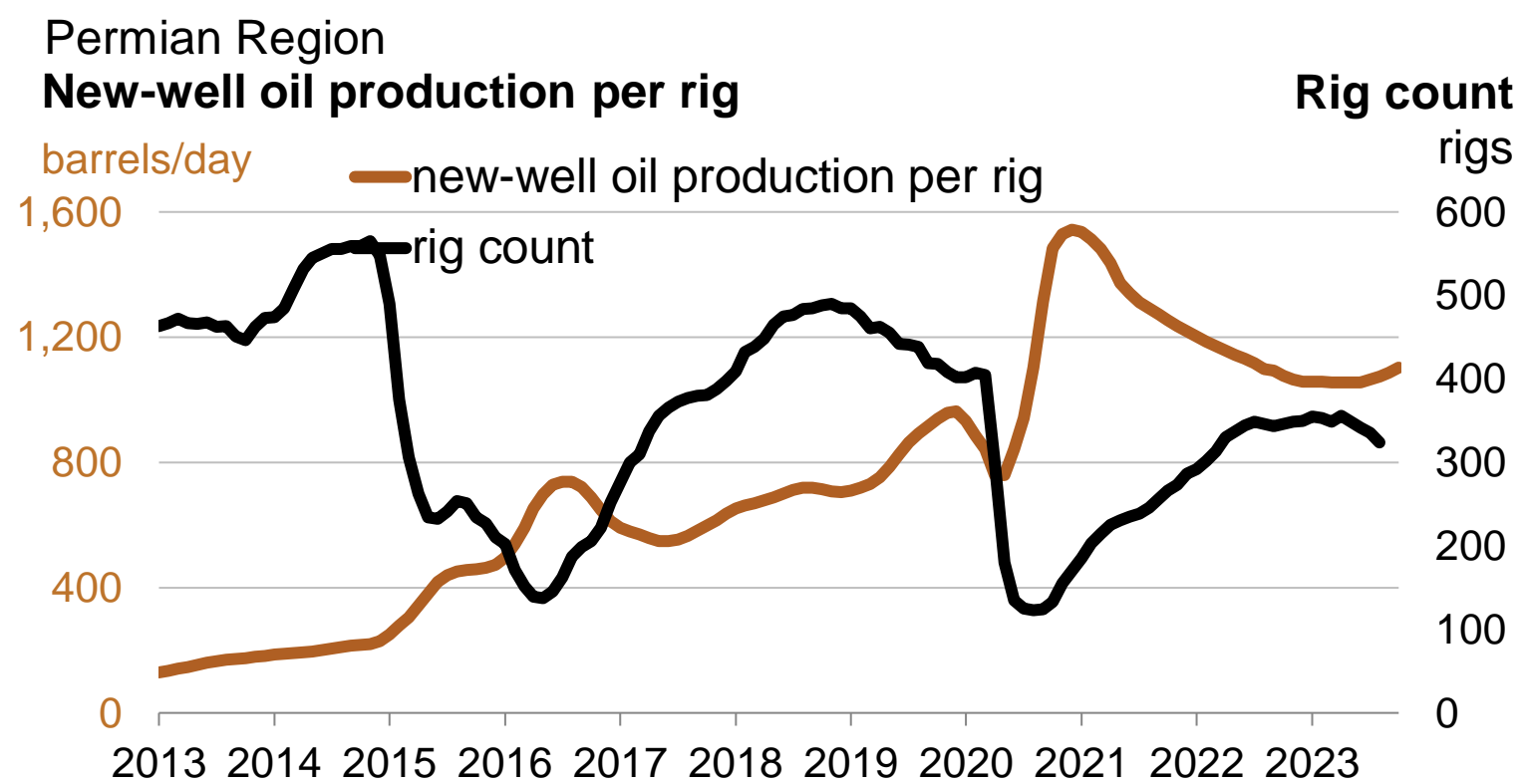
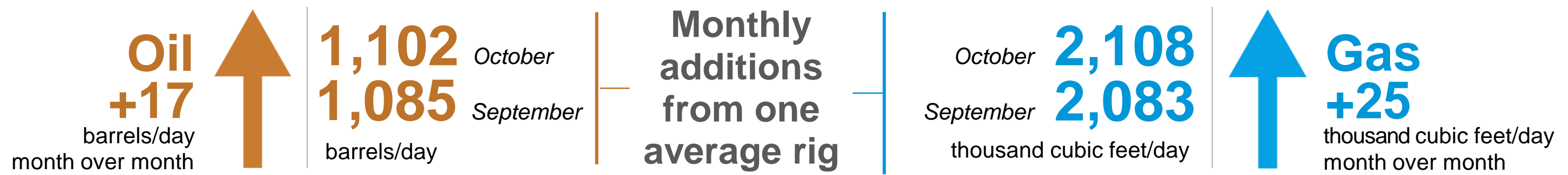


eia Permian Region

Drilling Productivity Report

September 2023

drilling data through August
projected production through October



The Drilling Productivity Report uses recent data on the total number of drilling rigs in operation along with estimates of drilling productivity and estimated changes in production from existing oil and natural gas wells to provide estimated changes in oil¹ and natural gas² production for seven key regions. EIA's approach does not distinguish between oil-directed rigs and gas-directed rigs because once a well is completed it may produce both oil and gas; more than half of the wells do that.

Monthly additions from one average rig

Monthly additions from one average rig represent EIA's estimate of an average rig's³ contribution to production of oil and natural gas from new wells.⁴ The estimation of new-well production per rig uses several months of recent historical data on total production from new wells for each field divided by the region's monthly rig count, lagged by two months.⁵ Current- and next-month values are listed on the top header. The month-over-month change is listed alongside, with +/- signs and color-coded arrows to highlight the growth or decline in oil (brown) or natural gas (blue).

New-well oil/gas production per rig

Charts present historical estimated monthly additions from one average rig coupled with the number of total drilling rigs as reported by Baker Hughes.

Legacy oil and natural gas production change

Charts present EIA's estimates of total oil and gas production changes from all the wells other than the new wells. The trend is dominated by the well depletion rates, but other circumstances can influence the direction of the change. For example, well freeze-offs or hurricanes can cause production to significantly decline in any given month, resulting in a production increase the next month when production simply returns to normal levels.

Projected change in monthly oil/gas production

Charts present the combined effects of new-well production and changes to legacy production. Total new-well production is offset by the anticipated change in legacy production to derive the net change in production. The estimated change in production does not reflect external circumstances that can affect the actual rates, such as infrastructure constraints, bad weather, or shut-ins based on environmental or economic issues.

Oil/gas production

Charts present all oil and natural gas production from both new and legacy wells since 2007. This production is based on all wells reported to the state oil and gas agencies. Where state data are not immediately available, EIA estimates the production based on estimated changes in new-well oil/gas production and the corresponding legacy change.

Footnotes:

1. Oil production represents both crude and condensate production from all formations in the region. Production is not limited to tight formations. The regions are defined by all selected counties, which include areas outside of tight oil formations.
2. Gas production represents gross (before processing) gas production from all formations in the region. Production is not limited to shale formations. The regions are defined by all selected counties, which include areas outside of shale formations.
3. The monthly average rig count used in this report is calculated from weekly data on total oil and gas rigs reported by Baker Hughes.
4. A new well is defined as one that began producing for the first time in the previous month. Each well belongs to the new-well category for only one month. Reworked and recompleted wells are excluded from the calculation.
5. Rig count data lag production data because EIA has observed that the best predictor of the number of new wells beginning production in a given month is the count of rigs in operation two months earlier.

The data used in the preparation of this report come from the following sources. EIA is solely responsible for the analysis, calculations, and conclusions.

Drilling Info (<http://www.drillinginfo.com>) Source of production, permit, and spud data for counties associated with this report. Source of real-time rig location to estimate new wells spudded and completed throughout the United States.

Baker Hughes (<http://www.bakerhughes.com>) Source of rig and well counts by county, state, and basin.

North Dakota Oil and Gas Division (<https://www.dmr.nd.gov/oilgas>) Source of well production, permit, and completion data in the counties associated with this report in North Dakota

Railroad Commission of Texas (<http://www.rrc.state.tx.us>) Source of well production, permit, and completion data in the counties associated with this report in Texas

Pennsylvania Department of Environmental Protection

(<https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Welcome/Welcome.aspx>) Source of well production, permit, and completion data in the counties associated with this report in Pennsylvania

West Virginia Department of Environmental Protection

(<http://www.dep.wv.gov/oil-and-gas/Pages/default.aspx>) Source of well production, permit, and completion data in the counties associated with this report in West Virginia

Colorado Oil and Gas Conservation Commission (<http://cogcc.state.co.us>) Source of well production, permit, and completion data in the counties associated with this report in Colorado

Wyoming Oil and Conservation Commission (<http://wogcc.state.wy.us>) Source of well production, permit, and completion data in the counties associated with this report in Wyoming

Louisiana Department of Natural Resources (<http://dnr.louisiana.gov>) Source of well production, permit, and completion data in the counties associated with this report in Louisiana

Ohio Department of Natural Resources (<http://oilandgas.ohiodnr.gov>) Source of well production, permit, and completion data in the counties associated with this report in Ohio

Oklahoma Corporation Commission (<http://www.occeweb.com/og/oghome.htm>) Source of well production, permit, and completion data in the counties associated with this report in Oklahoma